Forest Health Cooperative

Auburn University

Winter/Spring Newsletter 2024

Directors 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 FY24 Annual Meeting was held August 2-3, 2023 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. Hyper link to the meeting article: https://cfwe.auburn.edu/pine-forest-workshop/

More information will be coming soon about the dates and agenda for the FY25 Annual meeting. We would like to welcome our new members Campbell Global, ArborGen, and The Wilcox Foundation. Jessica and I will continue to work toward increasing membership throughout the year.

Graduate and Undergraduate Students

Graduate and undergraduate students' contributions to the program continue to be critical. Forest Health students have had a great year winning awards, which include Best Presentation, Travel Scholarships, and Research Scholarships. A big congratulation to them for their hard work and efforts on their projects! We additionally welcomed two new Ph.D. students, Jaden King and Sharmin Toa, and a masters' student, Emmanuel Nyarko, this year to work on Brown Spot Needle Blight. Listed below are the current students and a little bit about them and their project.

Jaden King – PhD Student
Sharmin Toa – PhD Student
Emmanuel Nyarko – MS Student
Maddox Golden – Undergraduate Research Fellow
Andrew Howard – Undergraduate Research Fellow
Joseph Anglin – Undergraduate Research Fellow
Solana Hendrickson – Undergraduate Research Fellow

What's Inside?

Call Us!

Lori Eckhardt	334.844.2720
Nancy Loewenstein	334.844.1061
Elizabeth Bowersock	334.844.1004
Jessica Baldwin	334.844.1538
Jaden King	334.844.8116
Sharmin Toa	334.844.8116
Emmanuel Nyarko	334.844.8116
Forest Health Dynamics Lab	334.844.1058
Forest Health Entomology Lab	334.844.8036

Student Research Reports

Effects of Brown Spot Needle Blight Infection and Spread on the Growth of Loblolly Pine –

Jaden King- PhD Student

Hello, I'm Jaden King, and I joined this lab in January this year. My research focuses on the impact of brown spot needle blight (*Lecanosticta acicula*), a fungal infection, on loblolly pine (*Pinus taeda*). I'm interested in how this disease affects tree processes, such as photosynthesis, growth, water movement, defense, and needle anatomy. I've spent my first year collecting data from several plots across Alabama. We've set up nine plots in southern Alabama near Mobile and five in northern Alabama near Cullman. Currently, we're setting up multiple plots in the National Forest across Alabama, which will be ready for next year. So far, I've collected data on tree height, DBH, tree cores (Image 1) to obtain growth and age, water stress measurements, resin secretion, sporulation chambers, disease rating, and crown rating. Next year, I plan to continue these measurements and collect soil samples, run a nutrient analysis, and examine needle anatomy.

Figure 1. Tree cores removed from tree to analyze growth rating and age.

Based on my observations of the sporulation chambers, I have found *L. acicola*, *Pestalotiopsis*, *Trichoderma*, *Hendersonia*, and *Diplodia*. Preliminary data shows more disease present on the tree results in thinner crowns which in turn reduces tree growth due to a lower photosynthetic area. Resin is a defense mechanism that gets secreted out of trees when injured or invaded. Findings show resin secretion increases with age, suggesting older trees prioritize resin production over growth to combat disease.

Figure 2. The left image shows a hole punched through the bark to reach the cambium layer. The right image shows 15mL tubes placed over the hole on the North and South side of the tree to collect resin.

Environmental factors that drive the emergence and severity of infection from Lecanosticta acicola on loblolly pine across Alabama and the southeastern USA –

Sharmin Toa- PhD Student

Today's world experiences an increasing variety of signs of the effects of climate change, not just in our regular weather patterns but also in our woods. In areas where natural disasters and environmental problems pose a growing threat to our natural landscapes, ground-breaking studies are being conducted to comprehend the complex connections between these events and the development of forest diseases. A key component of this project is a thorough examination into the spread of Brown Spot Needle Blight on pines, which poses a serious threat to the health of forests, especially after hurricanes and tornadoes.

This study meticulously maps and examines hurricane and tornado patterns using cutting-edge methods such ArcGIS Pro, providing significant new knowledge about how these natural catastrophes affect the spread of this pathogenic blight. In order to improve the geographical analysis, advanced statistical models will be created using R programming, providing a numerical perspective that helps comprehend and forecast the complex dynamics of pathogen dissemination.

This endeavor transcends in addition to mere academic research. It's a critical step in providing policymakers, environmentalists, and foresters with

the information and resources they need to prevent forest diseases in the face of escalating climatic extremes. Through the integration of advanced geospatial analysis and robust statistical modelling, this study provides insights that facilitate well-informed decision-making on forest management and conservation initiatives.

As we stand at the crossroads of environmental stewardship and technological advancement, this research serves as a beacon, guiding efforts to safeguard our forests against the ever-evolving threat of pathogens in a changing world.

As a dedicated student of forestry at Auburn University, I am on a journey to blend academic knowledge with practical action. My goal is simple yet profound: to use what I learn here to make a real difference back home in Bangladesh.

Bangladesh, with its unique position in the deltaic floodplain, is on the frontline of climate change impacts. This brings a host of environmental challenges, especially for our forests and ecosystems. My plan is to take the cutting-edge forestry practices and insights I am learning and adapt them to our local context.

One of my main focuses will be on forest health management. Healthy forests are not just about beautiful green spaces; they are crucial for biodiversity, climate regulation, and protecting against natural disasters, which are all too common in our region. By educating communities and working with local environmental groups, I aim to implement strategies that will keep our forests robust and resilient. Management of pathogen spread is a further area of importance. With the knowledge I'm gaining on forest diseases and their management, I plan to develop strategies tailored to the challenges faced by Bangladeshi forests. This includes raising awareness about how to prevent and control the spread of tree diseases, which is especially important in a country where agriculture and forestry play a significant role in people's lives.

Ultimately, my vision is for a Bangladesh where communities are actively engaged in protecting and enhancing our natural environment. Through workshops, community projects, and collaboration with local environmental groups, I hope to foster a sense of stewardship and collective action towards a greener, more sustainable future.

I am excited about this journey and the opportunity to serve my nation in creating a more environmentally conscious society. With each step, I move closer to bridging the gap between academic learning and meaningful change in the face of climate challenges.

Detection of Brown Spot Needle Blight Using UAV Remote Sensing–

Swati Singh- PhD Student

I am Swati Singh, a Ph.D. student in the Geospatial Analytics lab under the guidance of Dr. Lana Narine. My research focuses on identifying Brown Spot Needle Blight (BSNB) foliar disease in loblolly pine (*Pinus taeda*).

In my ongoing research, I am developing a remote sensing framework for Brown Spot Needle Blight (BSNB) detection. Fieldwork is being conducted at two distinct sites (Washington and Cullman County), where a total of 14 FIA plots have been established. Last summer (2023), we successfully collected data using Unmanned Aerial Vehicles (UAVs) equipped with multispectral and lidar sensors. Our current efforts involve the integration of field data with multiple remote sensing sources to differentiate BSNB severity levels.

Preliminary results are promising, indicating that UAV-based high-resolution imagery has the potential to discriminate between healthy and diseased foliage (figure 1). Leveraging various remote sensing spectral bands (RGB, Red Edge, and NIR) and point clouds enables us to distinguish healthy, early, and severe disease based on their distinct changes in color and structure at the individual tree crown level. Remote sensing not only speeds up the detection

process, but also provides valuable information about the spatial and temporal dynamics of disease outbreaks. Its ability to provide rapid, large-scale, and scalable multi-source forest health monitoring (FHM) enhances our understanding of ecosystem health.

Genetic diversity of Lecanosticta acicola pathogen-

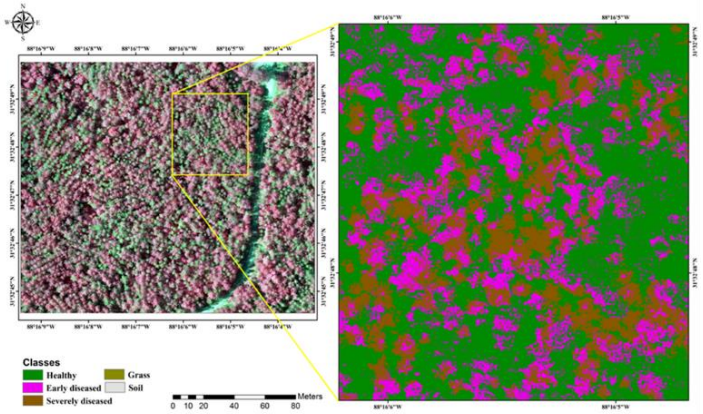

Figure 3. Classification map categorizing healthy, early-stage, and severe Brown Spot Needle Blight (BSNB) infection in loblolly pine.

Temitope Folorunso- PhD. Student

I am a second year Ph.D student in the Willoughby conservation and genomics lab and am working on a multidimensional project on how to manage *Lecanosticta acicola*, a phytopathogenic causing brown spot need blight disease on pine trees. I am interested in quantifying and comparing the genetic diversity and population structure of *L. acicola* at a regional, stand, and within tree scale. This is important because it will provide needed insight into the evolutionary potential of this fugus. In the past year, we have sampled needles from loblolly, slash and longleaf pine in Alabama and processed symptomatic needles for culturing and for molecular identification. Based on preliminary results, we have morphologically (Figure 4) and molecularly (Figure 5) identified *L. acicola* in most of our sample sites. We also found that *L. acicola* is a slow growing fungus and preliminarily, the morphology and structure we observed suggest high variability of *L. acicola* in the southeast, possibility indicating high genetic diversity. Currently, we are refining our DNA handling in preparation for long read sequencing to identify genetic variants that will form the basis for our genetic assessments. In the coming years, I will also focus on the genetic determinants of virulence in *L. acicola* to understand the mechanisms underlying *L. acicola* pathogenicity in pine trees. Combined, my project aims to provided needed basic data on *L. acicola* spread and the genetic determinants of virulence.

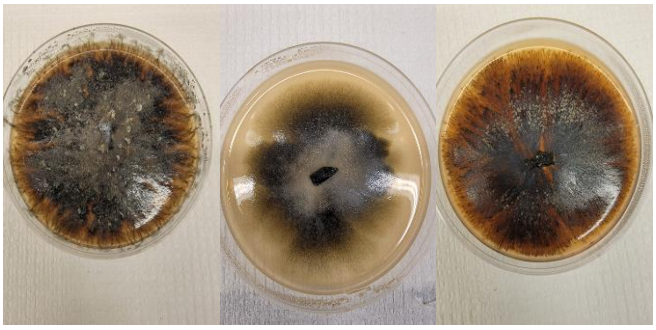

Figure 4. Morphologically identified positive *L. acicola* isolate, according to European and Mediterranean Plant Protection Organization 2015, needles plated, and suspected positive for *L. acicola* using morphological indicators are first molecularly confirmed.

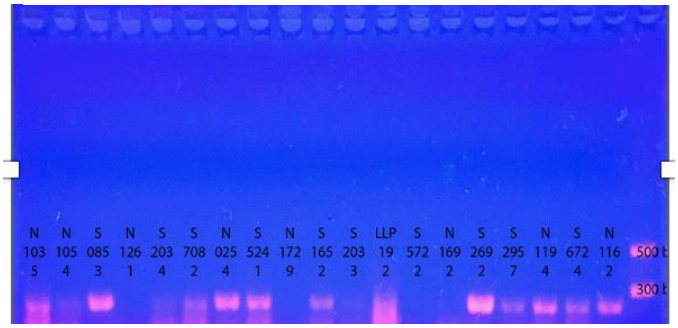

Figure 3. Gel electrophoresis image confirming *L. acicola* isolate via PCR; bands represent DNA separation, with each lane's number as the sample ID, and the rightmost lane containing the DNA ladder size marker.

Fungal pathogens associated with Brown Spot Needle Blight

Emmanuel Nyarko- M.S. Student

My work on the Brown Spot Needle Blight Project focuses on finding out more about the fungal pathogen (*Lecanosticta acicola*) that causes this disease as well as other associated foliar pathogens and how they affect the trees. Brown spot infested study plots were set up earlier this year, and needle samples are collected monthly from March to

November. The samples are kept in an ice cooler and transported to the laboratory for processing. Upon arrival, the symptoms on the needles are described and recorded. The processing involves an initial surface sterilization, and then subsequent plating unto different media (MEA, PNA, PDA, and MEPNA). The plates are incubated at 20 -25˚C for 5 days to 2 weeks and monitored for mycelial growth. When mycelial growth is observed, it is sub-cultured unto 2% Malt Extract Agar to obtain a pure culture of growing fungal mycelium for easy identification. The method that has been employed for detection the fungi present is morphological identification which involves staining the fungal mycelia on a glass slide and observing it a compound microscope. So far, *Lecanosticta acicola* has been identified as well as other pathogens such as *Pestalotia*, *Alternaria*, and *Cladosporium*. However, *Pestalotia,* is the predominant pathogen that has been identified. It usually occurs as white mycelia with dark conidia and several cells which are pointed at their ends.

Figure 4. Pure culture of *Pestalotia* on PDA.

The future of the work will be to assess the susceptibility of eleven different loblolly pine families to *L. acicola*. This will be done by exposing seedlings of these pine families to the natural conditions in L. acicola infected plantations for infection to be established. *Lecanosticta acicola* overwinters either within diseased needles still on the trees or on fallen needles that are already infected. During the spring season, spores are discharged and disseminated to fresh needles through the action of rain splashes or wind. For infection to take place, the needles must be in a moist state, hence most infection occurs in the spring period. The seedlings will be inspected every two weeks once it has been deployed. After a period of three months, the seedlings will be sampled monthly by taking symptomatic needles for processing and subsequent fungal pathogen identification tests in the Forest Health Dynamics Laboratory.

Loblolly Seedling Innoculaton Equipment

Drew Conway- Undergraduate Student

My project objective is to develop and construct a device that we can use to inoculate pine seedlings with Brown Spot Needle Blight. As of now I have a prototype that is subject to change but the idea works. I used a pvc pipe frame and wrapped the frame in plastic to have a closed environment around the seedling. I ran an irrigation nozzle through the top side of the plastic to provide water to the seedling and mimic rainfall in the forest. I also mounted a fan to one of the corners on the topside of the structure inside the plastic in order to act as natural wind in the

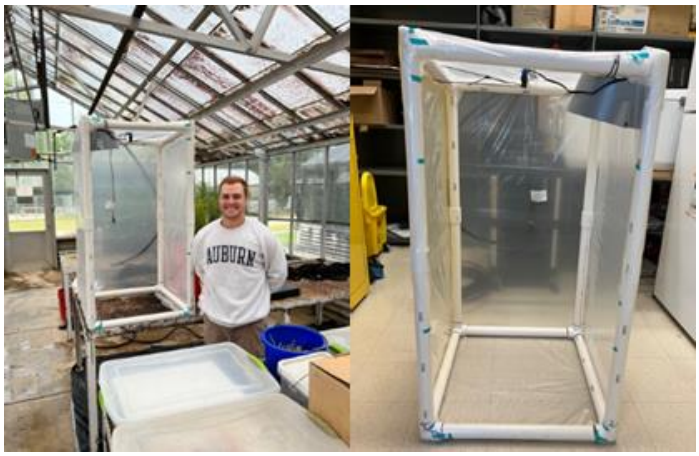

Figure 5. Drew Conway with his infection chamber.

forest. The bottom side of the structure will not have plastic sheeting so that we can set the device around the seedling by setting the device on top of the seedling. We will place infected needles around the base of the seedling and document how long it takes for the healthy seedling to start showing symptoms of the fungus. This will give us an idea for how long it takes the fungus spores to spread from infected needles to healthy trees in loblolly pine stands across the Southeastern United States. My future plans include changing the size of the structure to be

smaller so that we can place more of them in the greenhouse.

Using Sporulation Chambers to Study BSNB Infection Trends

Andrew Howard- Undergraduate Student

Brown Spot Needle Blight (BSNB) is caused by the fungus *L. acicola*, an obligate parasite of pine needles. For those who are not familiar with my project, I am using sporulation chambers (which are basically petri dishes with a piece of filter paper sprayed with distilled water and a pine needle) to identify trends in BSNB infection. When spores develop on the needles, I scrape them onto a microscope slide for analysis. I analyze trends such as the areas in our study with the highest infection rates, analyzing the presence of other fungi on the needles, and determining how weather conditions affect BSNB infection rates.

As we approach the end of the sampling season for the first year of our BSNB study, I have begun to analyze some of my findings (from March to June).

Figure 6. Andrew Howard collecting needles and holding needles.

It seems that *L. acicola* becomes more abundant as temperature increases in the spring (especially seen in Cullman County). It also seems that *L. acicola* likes moderate temperatures instead of extreme heat, so I intend to look at this relationship as I analyze late summer's findings. There certainly seems to be a relationship between rainfall and infection rates as well. For instance, as rainfall in Cullman decreased sharply after the month of May, infection rates dropped. In Washington County, rainfall stayed more constant. As a result, the rises and drops in infection rates do not seem to be as sharp.

All of the data listed above are initial findings. While there is not yet enough data to draw any definite conclusions, I look forward to analyzing the rest of this year's data and gathering more samples next year.

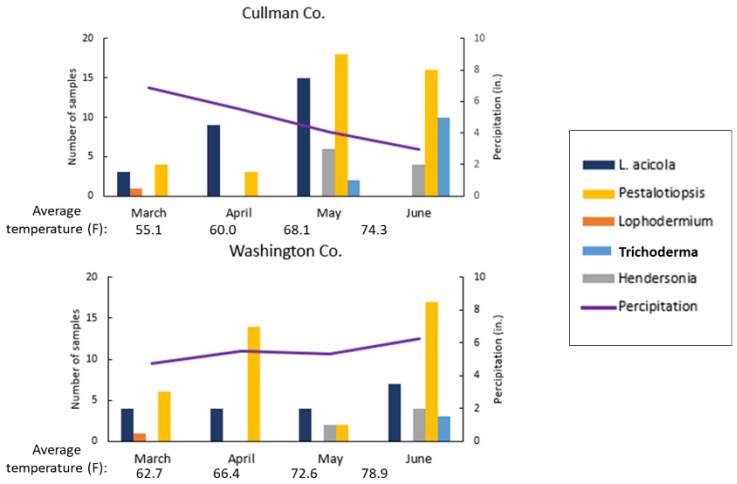

Figure 7. Fungi recovered from sporulation chambers.

Does Brown Spot Needle Blight Affect Loblolly Growth?

Maddox Golden- Undergraduate Student

My project is focusing on the effects of BSNB on loblolly pine growth as well as the disease's spread throughout a stand. This is mainly a dendrochronological study, meaning we are mapping the severity and timing of disturbance using annual growth rings. We are using both tree and stand level data to gain insight into this disease. Specifically, we hope to determine a correlation between the growth of loblolly pine and BSNB severity and map the emergence and spread of the pathogen throughout the stand.

The study site is a 26-year-old loblolly pine (Pinus taeda) stand in the Osco forest of Cullman county, Alabama. The stand has a dense hardwood midstory. It is 9.5 acres and thinned to a basal area of 60ft²/ac.

Figure 8. Taking LAI readings.

So far, we have collected tree cores, disease rating, heights, and DBHs from 333 trees. For our site data we collected LAI, PAR, slope, elevation, aspect, and convexity. We took LAI and PAR in July and November to get a good idea of the stand's condition throughout the year. We have also collected needle samples from 25 trees, from those that were cored, and these have been processed in the lab, giving us a picture of the fungi present on these trees.

Because my study is focused on dendrochronology, tree core samples are the crux. I've assessed their age as well as growth increments for the most recent 5 and 10 years. From this data as well as data from disease rating, I will test for a correlation between growth rate and disease severity. To do this, I have divided the trees into 3 severity levels: high, medium, and low, which will allow me to determine significant differences between the groups.

Figure 9. Two students coring a tree.

There's still a lot to do, however. In the future, I will extract DNA from needle samples to determine the presence of *L. acicola*. I will measure annual growth rings in the tree core samples and finally perform statistical analyses on the data.

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.

The Forest Health Cooperative was involved throughout the baiting and testing process in Alabama and Mississippi. The pathogen has been recovered in spring 2022 and spring 2023.

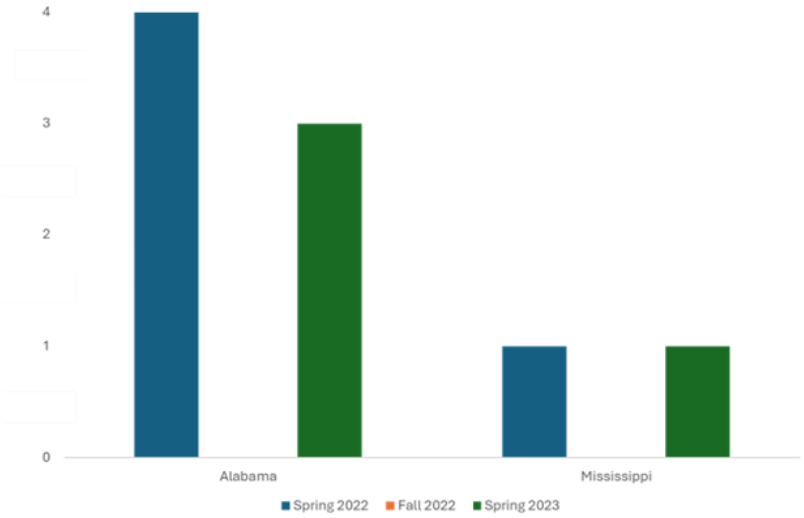

Figure 10. *P. ramorum* positives in Alabama and Mississippi

Diagnostics Clinic- We have updated the procedure for sample submission to make it more user friendly. The updated copy is available on the cooperative website.

The Forest Health Cooperative staff saw a variety of issues this year. The most frequent repeat occurrence was Brown Spot Needle Blight. If you have questions about this ongoing issue please contact us.

Here is a list of problems we were involved in during 2023:

1. BSNB on loblolly
2. Pine decline on loblolly
3. Pitch Canker
4. Ips beetle
5. Southern Pine Beetle
6. Hypoxylon Canker

Featured Pests

Southern Pine Beetle, *Dendroctonus frontalis* Zimm. – Jim Meeker

The southern pine beetle (SPB) is one of the most destructive insect pests of pines in the South. This small (2-4 mm in length), reddish-brown to black, bark beetle is a cyclical outbreak species capable of explosive population growth (having 7-9 generations per year with development time from egg to adult occurring in as little as 28 days). During outbreaks SPB can cause rapid and widespread tree mortality on an area-wide basis. Female beetles initiate attacks by boring through the outer bark of the main bole and into the cambium layer (typically resulting in a creamy white pitch tube, resembling popcorn and typically located in the cracks of the outer bark). There they begin constructing winding, S-shaped galleries in the inner bark, just outside of the wood. Once a suitable tree is successfully attacked the beetles utilize a very effective chemical communication system involving pheromones and host odors to signal-in more adult males and females. The resulting mass attack process overwhelms the defenses (pitch response) of even apparently healthy pines. Trees can thus be killed in a matter of days, due both to the girdling action of their galleries (by both adults and their larval offspring), and the introduction of blue-stain fungi into the wood (xylem). Infestations typically occur in the form of spots (groups of neighboring trees) and can expand at rates of up to 50 ft/day, growing from dozens of infested trees up to more than 1,000 acres in a single season.

Figure 11. SPB damage in loblolly pine.

State	Number of spots		Acres affected	
	National Forest	State/Private	National Forest	State/Private
Alabama	452	841	321	302
Florida	37	51	4	119
Georgia	441	426	187	1,100
Louisiana	0	74	0	332
Mississippi	1,147	582	443	91
South Carolina	308	220	554	177
Virginia	0	16	0	16
Total	2,385	2,210	1,508	2,137

Figure 12. Number of active spots and acres affected by SPB in federal, state, and private lands from the Southeast states in 2023.

The SPB can kill all species of pine in the Southeast states, but loblolly, shortleaf, pond, Virgina, and spruce pine are the most favorable hosts. Trees as young as five years old may attacked and killed, but SPB most commonly impacts stands of pulpwood-sized tree and larger (e.g. sawtimber). Stand conditions highly susceptible to successful infestations, spot growth and associated tree losses are those containing favorable hosts with high host tree density/stocking levels or tight spacing between trees. Stands with basal areas equal to or greater than 120 sq. ft. per acre are considered high hazard for experiencing SPB related losses. The most effective means of preventing SPB infestations and associated losses is to thin stands to basal areas of 80 sq. ft. per acre or less, or providing at least 18-20 ft. spacing between leave trees.

To control active infestations of SPB that threaten additional trees, the most effective tactic is to rapidly conduct Cut & Remove operations that take out all of the currently infested trees as well as a buffer strip of uninfested trees in advance of their direction of spread. Effective buffer strips (established at the time of harvesting operations) are typically the width of the average height of trees in the stand, or 100 ft. If an active infestation is unmerchantable (i.e., too small or inaccessible), those involving less than 50-infested trees may be treated in the hotter summer months by the Cut & Leave spot disruption strategy. This technique involves directionally felling infested trees and an uninfested buffer strip (around spot heads) towards the older dead vacated trees, and away from uninfested portions of the residual stand. In order to minimize impacts from SPB, especially during outbreak periods, pine trees/stands should be frequently monitored and actively enlarging infestations involving 20 or more trees should be treated promptly.

During 2023, SPB activity has been reported in seven states (AL, FL, GA, LA, MS, SC, and VA). A total of 4,595 active SPB spots were detected in federal, state, and private lands from these states, and total acres affected were estimated at 3,645 (see Table). The activity increased significantly from 2022 when a total of 992 active spots were reported with 2,090 affected acres. The number of counties in outbreak status across the states also increased from just one (in SC) in 2022, to nine in 2023 (three in AL, three in GA, two in MS, and one in SC). Given the recent rise in SPB throughout these states, folks should be extremely vigilant and prepared to respond to potentially troublesome SPB activity in 2024.

Invasive Species Plant List – Dr. Nancy Loewenstein

Have you ever wondered how state invasive plant lists are developed? Or if a species listed as invasive in one state means the same thing as it being listed as invasive in a neighboring state? The answer to the first question is that it varies by state, which means that the answer to the second question can often be 'no'. This impacts data sharing and can be confusing to natural resource professionals and the general public alike.

To address this issue, a team from the University of Florida, University of Georgia, Clemson and Auburn are working on a Regional Invasive Plant Status Assessment (RIPSA) tool that will provide a

transparent, repeatable, evidence-based process to rank and list species. The tool is designed to assess the current status of a species within a specific region of interest (designated by the user). It is comprised of four sections of questions to evaluate: 1) current distribution, 2) establishment and spread potential, 3) impacts, and 4) management difficulty of each species. Multiple choice answers are assigned a score, and invasive species ranking is determined by the total score. Assessors are to base the answers on a combination of peer-reviewed literature, grey literature, expert opinion and distribution data from EDDMapS, Global Biodiversity Information Facility (GBIF), iNaturalist (research grade only), herbaria data portals like Southeast Regional Network of Expertise and Collections (SERNEC). Referencing as many sources as possible is recommended.

As state invasive plant councils update their lists, it is hoped that use of the RIPSA tool will provide more rigor and consistency, facilitating data sharing and interpretation of results for stakeholders and the general public across the region.

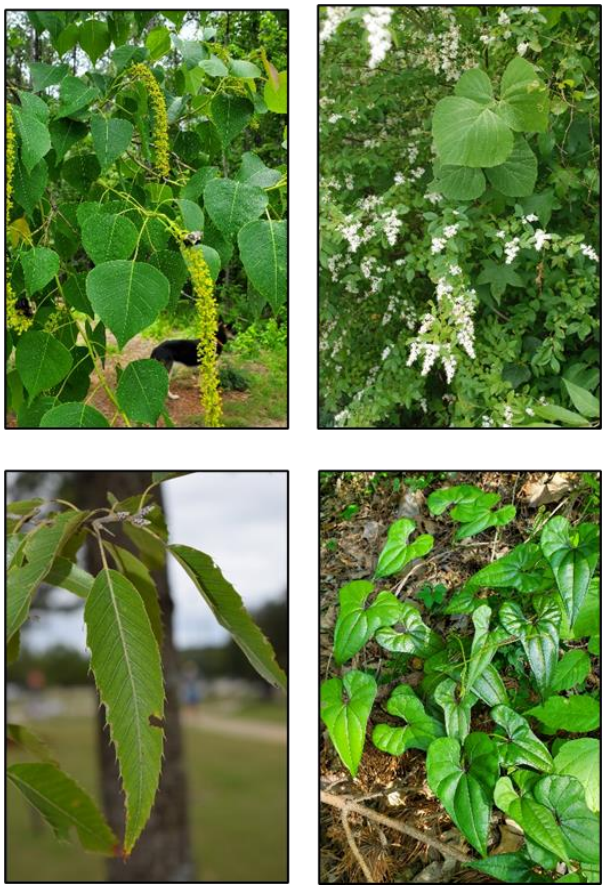

Figure 13. Invasive plants in Alabama.

Miscellaneous

A field visit with a soil scientist- During November, Dr. Emily Carter joined the forest health dynamics lab at one of our brown spot needle blight field sites. Dr. Carter took the time to teach members of the lab how to classify and describe the properties of soil color and texture. In preparation of the soil sampling, we intend to perform in 2024.

Figure 14. Dr. Carter teaching the FHDL about soil profiles.

School visits- The Forest Health Dynamics lab hosted several junior and high school groups visit our lab during their tours of Auburn University. Both graduate and undergraduate lab members engaged with students to offer them an opportunity to see firsthand what our lab does, as well as, understand the importance of the forest health in the role that insects and disease plays.

Schools:

Thompson High School – 1/10
Eclectic Middle School – 6/27
Robertsdale High School – 10/11
Clements High School – 10/19
Munford Middle School – 11/9
Auburn High School – 12/5

Figure 15. Graduate and undergraduate students working together to teach forest health to middle and high school students.

Accolades

Swati Singh - Detection of Brown Spot Needle Blight Using UAV Remote Sensing, Best Poster Award at the Southern Forestry and Natural Resources GIS Conference, Athens, GA

Jaden King – Brown Spot Needle Blight – a growing threat to loblolly pine, Top Graduate Poster Presentation in Agriculture, Soil and Natural Resources, Sigma Xi International Forum on Research Excellence, Long Beach Conference

Sigma X Research Honor Society Inductees:

- Jaden King
- Emmanuel Nyarko
- Sharmin Toa
- Temitope Folorunso
- Maddox Golden

Thank you for your continued support!