

CU IN THE WOODS

Clemson Extension Forestry and Wildlife Newsletter



Invasive Pests in South Carolina Forests: Those Here, and Those on the Way

By Dave Coyle

<https://blogs.clemson.edu/fnr/2023/03/27/invasive-pests-in-south-carolina-forests-those-here-and-those-on-the-way/>

The forests of South Carolina – like those throughout the United States – certainly have their share of pests. While most of these pests are native and typically only impact stressed or injured trees, several non-native species are present and established in South Carolina. And of those non-native species, a few are true invasives, capable of causing widespread economic and/or ecological damage. This article will give an update on invasive forest pests already established in our forests and some to be on the lookout for as well.

Two unregulated pests in South Carolina's forests are the emerald ash borer and laurel wilt. The emerald ash borer is established in several Upstate counties and has been for several years. Adults are a bright green beetle, while larvae are whitish in color and feed on the phloem of a tree (just under the bark). Larval feeding is capable of killing mature trees in just a few months, as their winding feeding galleries cut off nutrient transport within the tree and essentially cause starvation. Little can be done to manage populations in natural areas, though there are several biological control agents that have been shown to help reduce beetle populations. These beetles only impact ash (*Fraxinus*) in our area, so if you have dying ash, it's worth checking it out and notifying your local Extension agent or SC Forestry Commission forester. Laurel wilt, a devastating disease spread by the redbay ambrosia beetle, is present in most of the eastern half of the state and is making its way into the Upstate as well. This disease affects all species in the family Lauraceae, which includes redbay and sassafras. The beetles attack healthy trees and introduce fungal spores, which quickly grows and clogs the tree's water-conducting tissues. Trees rarely survive once infected.

The Asian longhorned beetle is under federal and state regulation, and is (still) confined to an area in Charleston and Dorchester counties. This large black and white beetle primarily attacks maple (*Acer*), but can also use poplar (*Populus*), willow (*Salix*), birch (*Betula*), sycamore (*Platanus*), and elm (*Ulmus*). Larvae can get up to nearly 2" long and feed on the wood, causing branches and stems to break. The good news is that this pest can be eradicated! The bad news is that total host removal is necessary, which means removing and grinding the infested tree and stump.



Emerald ash borer. Image credit: Dr. Matt Bertone, NC State University.



Asian longhorned beetle. Image credit: Dave Coyle, Clemson Extension.

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Find out about all of our upcoming events by visiting our events page:

<https://www.clemson.edu/extension/forestry/events.html>

Looking for more forestry and wildlife information?

Check out our blog page for past articles and other great forestry and wildlife information-

blogs.clemson.edu/fnr

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Invasive pests cont.



Adult spotted lanternfly. Image credit: Dave Coyle, Clemson Extension.

The spotted lanternfly and elm zigzag sawfly aren't known to be present in South Carolina yet, but both are established in our neighbor state, North Carolina. The spotted lanternfly is an insect that feeds on over 100 different host plants, including several smooth-barked hardwoods, like maples and young walnuts (*Juglans*). Spotted lanternfly hasn't been shown to be a forest pest (yet), but feeding by this insect can negatively impact tree growth and health. There is a quarantine for spotted lanternfly, and we are asking anyone who sees this pest to report it immediately, as the impacts of this pest are both known and significant.

The elm zigzag sawfly is also present in North Carolina and is capable of defoliating elms of any species and size. Both of these pests are fairly distinctive in appearance, as spotted lanternfly is black with white and red coloration when young, and can be over 1/2 inch long. Elm zigzag sawfly larvae make

characteristic feeding patterns in leaves, and can quickly defoliate entire trees. If you see either of these pests, please let your local Clemson Extension agent or SC Forestry Commission forester know right away.

Find out more about these pests at our state regulatory page (<https://www.clemson.edu/public/regulatory/plant-industry/invasive/index.html>) and report them if you see them!



Elm zigzag sawfly. Image credit: Eric Day, Virginia Tech.

Meet Our New Agents!



Amanda Taylor- Savannah Valley Forestry and Wildlife Agent

Amanda Taylor

(Covering Allendale, Beaufort, Charleston, Colleton, Dorchester, Hampton, Jasper)

I'm originally from Beaufort and I'm delighted to be back in the Lowcountry as the Forestry

and Natural Resources Agent. I recently graduated from Clemson with my degree in Parks, Recreation, and Tourism Management (PRTM). I concentrated in Conservation Areas Management, focusing on public lands, outdoor recreation, and program planning. While pursuing my degree, I researched wood ducks with the Kennedy Waterfowl Center, spent a summer as an Assistant Ranger at Hunting Island State Park, and worked as a leasing manager and event planner. I love people, I love programs, and I love the outdoors, so I'm excited to get started!

You can reach Amanda at the Beaufort County Extension office 843-433-6027 or by email at ast4@clemson.edu.



Tancey Cullum Belken- Coastal Forestry and Wildlife Agent

Tancey Cullum Belken

(Covering Berkeley, Charleston, Florence, Georgetown, Horry, Marion, Williamsburg)

Tancey Cullum Belken was born and raised in Charleston, SC. She received

her B.S. in Wildlife and Fisheries Biology from Clemson University and began working in Youth Environmental Education after graduation. She started her career with Clemson Extension in 2020 as a Water Resource Agent and transitioned to the Forestry and Natural Resource Team in 2023. She is passionate about teaching others about the land they live on and how to be stewards of the land to ensure the perpetuation of that land for future generations. Her strengths include freshwater wetland management, stormwater monitoring, wildlife damage management, non-natives and invasives, and habitat management.

You can reach Tancey at the Florence County Extension office 843-519-2403 or by email at tanceyc@clemson.edu.

Your Pond as a Focal Area for Wildlife: Supplemental Habitat

By W. Cory Heaton

<https://blogs.clemson.edu/fnr/2023/04/10/your-pond-as-a-focal-area-for-wildlife-supplemental-habitat/>

This series of articles aims to help you make better-informed decisions regarding the management of your pond for fish and wildlife value. In the previous article, we discussed the zones of a watershed and the associated plant communities. We established that a healthy pond is a product of healthy plant communities in each of the zones leading to the pond. We discussed the many valuable services that these plant communities provide (runoff management, nutrient capture, carbon storage, wildlife habitat, etc.). In this article, we will discuss additional structures that can be added to your pond to improve its value to wildlife.

Supplemental habitat consists of many things. It could be the addition of aquatic plants, submerged woody structures, nest boxes, artificial fish structures, docks, piers, fish feeders, or many other things. We will touch on a few of these in this article, beginning with plants. Establishing a shrubby component to portions of your shoreline and shallow areas provides several benefits. Shrubs offer shade to wildlife and fish. Shade is often overlooked when considering habitat. Thermal refuge is critical to the survival of many species of birds, reptiles, amphibians, and even your fish. Shrubs offer excellent nesting structure for songbird and wading bird species that utilize the pond. Our resident wood duck populations depend on these shrubby areas to serve as cover and brooding areas for their offspring. If the right shrub species are used, they can provide valuable food resources for waterfowl, songbirds, pollinators, etc. Species that are particularly valuable for improving wildlife habitat include: Groundseltree (*Baccharis halimifolia*), Buttonbush (*Cephalanthus occidentalis*), Sweetpepperbush (*Clethra alnifolia*), Swamp titi (*Cyrilla racemiflora*), and Elderberry (*Sambucus canadensis*). There are many other species that offer similar value to wildlife. It is important to use native species and species that can be managed without the risk of taking over the pond.

Many species of aquatic plants provide valuable habitat components for wildlife and fish. Aquatic plants can be used to create structure, provide haven for juvenile fish, provide shady ambush areas for predatory fish, create sunning areas for amphibians, provide food resources for waterfowl, etc. Not all plants provide similar value to wildlife. It is important to identify which aquatic plants are present in the pond and determine their wildlife value. Undesirable species can be managed with chemical, biological, or manual removal. Species with little wildlife value can be replaced with more beneficial species. Species that benefit wildlife and fisheries in a pond include: Rush (*Juncus* species), Bulrush (*Scirpus* species), Watershield (*Brasenia schreberi*), Pickerelweed (*Pontederia cordata*), Smartweed (*Polygonum* species), Water lily (*Nymphaea*

odorata), Spatterdock (*Nuphar lutea*), and numerous other native aquatic species. Aquatic plants often require management to limit their occurrence to desirable areas. The general rule of thumb is to maintain total aquatic vegetation to cover no more than 10-15% of the pond's surface area.

Living aquatic and wetland vegetation provide important habitat features. Dead vegetation can provide important habitat as well. Felling trees into the pond provides excellent structure/cover for your fish. Surveying the trees

around your pond's perimeter will give you a better idea of which trees would be best for felling into the pond. Select trees that are not great mast producers, trees that may be declining in health, trees that may be a risk to structures or safety, etc. Just because these trees are not providing a great deal of value to wildlife on land, doesn't mean they can't provide abundant wildlife and fish value in the pond. We have observed extensive use of trees felled into ponds at Sandhill REC, by migrating waterfowl species.

Ducks rely heavily on emergent

limbs of fallen trees to provide loafing cover as they rest during migration. Heavily branched treetops exposed from the water surface act as a fence to deter avian predators and provide a break from heavy winds. You will also see the exposed portions of fallen trees frequently used by turtles, wading birds, and maybe an alligator.

Your pond may or may not be the ideal location for bird nest boxes. I commonly encounter wood duck nest boxes on ponds. Wood duck nest boxes should never be placed on ponds with bass, pickerel, or mudfish populations. Very few, if any, ducklings survive when reared in ponds with large predatory fish. Wood duck boxes should only be placed in wetlands that do not support fish populations. It takes significant energy and time for wood ducks to lay and incubate a clutch. If the offspring are lost to fish, it can have negative impacts on the population. In many cases, wood duck boxes become a population sink rather than a source. Songbird nest boxes and owl boxes are valuable additions to the watershed feeding your pond. Purple Martin houses can be a great asset to your pond, and the noticeable difference in mosquitos provides more reason to add them.

Improving the value of your pond for wildlife can be a rewarding experience. A healthy pond system supports a diversity of wildlife, both flora and fauna. There should always be something in bloom for the eyes to enjoy. Species will change throughout the year, often with regularity as accurate as your calendar. Healthy ponds are beautiful, and you will find yourself spending more and more time there.



Many species of aquatic plants provide valuable habitat components for wildlife and fish. Image credit: Cory Heaton, Clemson University.

Understanding Your Soil Test Report

By Jeff Fellers

<https://blogs.clemson.edu/fnr/2023/03/27/understanding-your-soil-test-report/>

In Extension, we often get calls about why someone's food plot is not growing as expected. While there can be a host of reasons why this is the case, the first thing one should examine is the soil pH and soil fertility. If the soil pH is not at the correct level, nutrients can be bound in the soil and are not available for the plants to absorb. For example, if you have a soil pH of 5.6, adding more fertilizer will not necessarily increase the health of the plants. We must first raise the pH before the plants can utilize the fertilizer we added. It can take three to six months to raise soil pH, so lime applications should be made well in advance of planting to raise the soil pH. Many of the plants we grow for food plots like a soil pH of 6.0 to 6.5 on the pH scale.

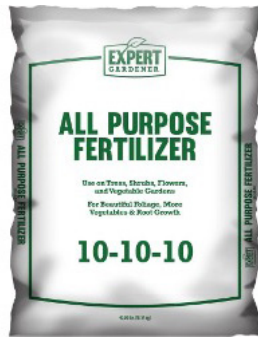


Figure 1. Bag of 10-10-10 fertilizer. Image Source: Walmart.com.

A common problem I see when discussing fertilization is the lack of understanding of what the numbers mean on a bag of fertilizer. Common analysis of bag fertilizer consists of 10-10-10, 17-17-17, 34-0-0, 0-45-0, and 0-0-60, to name a few. Those three numbers are the percentage of nitrogen (N), phosphorus (P), and potassium (K) that the bag contains. For instance, 10-10-10 has ten percent nitrogen, ten percent phosphorus, and ten percent potassium. So a 50-pound bag would have five pounds of nitrogen, five pounds of phosphorus, and five pounds of potassium. A bag of 0-45-0 would only contain phosphorus, and it would make up 45% of that bag. A 50-pound bag of 0-45-0 would contain 22.5 pounds of phosphorus.

I will not go into how to take a soil sample in this article. If you need help taking a soil sample, call your local Clemson Extension Office or read our soil testing factsheet on The Home and Garden Information Center webpage (<https://hgic.clemson.edu/factsheet/soil-testing/>).

Your soil sample report has been emailed or mailed to you; now what? First, you need to know the size of the area you plan to plant. This can be in square footage or acreage. Please do not guess at this number. There are many tools available (for free) to help you calculate the area of your planting. For those who have smartphones, I would recommend downloading an area calculation app. This app will allow you to walk or ride around the area to be planted with your smartphone and calculate the acreage or square footage. If you have a rectangular or square area to plant, you can always calculate the area using length multiplied by width. Google Earth can also be used to draw the area on an aerial photo and calculate the acreage. If you try to estimate this number, there is a good chance you will over or under estimate, which will result in you spending more money than needed or not providing enough soil amendments to help plant growth.

With the cost of fertilizer, calculating your area correctly can save you a lot of money.

Figure 2 shows a new plot that I plan to establish as a fall food plot this year. We will use this as an example. The plot is rectangular, so I measured the length and width of the plot. I measured the plot with a measuring wheel to be 30 feet wide by 330 feet long (30 X 330 = 9,900 square ft.). I also used Google Earth, as seen in figure 2, to calculate the area. Google Earth calculated the area by my best guess of drawing the plot on the aerial photo as 9,894 square feet. We can also convert that to acreage. One acre is equal to 43,560 square feet. To convert square feet to acreage, take 9,900 square feet and divide by 43,560 ($9,900/43,560 = .227$). This plot would equal 9,900 square feet or .23 acres.

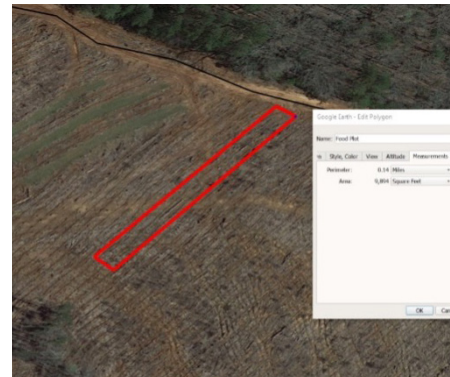


Figure 2. The food plot is highlighted in red, and the area calculation tool was used to calculate the area. Image Source: Google Earth.

When you receive your soil sample report, it should look like Figure 3 and Figure 4 on the next page. For this example let us assume that I will be planting oats. For oats, we will use the grasses for wildlife code, which is the second one under the crop section. Since our plot is not an acre, we will need to calculate exactly how much we need for our plot. Remember, the area of our plot is 9,900 square feet or .227 acres.

Here's how we will calculate the lime and fertilizer requirements for my plot based on my soil sample results:

Lime: Need 2,700 pounds per acre

- Convert 2,700 pounds of lime per acre to per 1,000 square feet
 - Divide 2,700 by 43.56 ($2,700/43.56 = 61.98$ pounds per 1,000 square feet)
- $61.98 \times 9.9 = 613.6$ pounds of lime for the new food plot

OR

- Use the .227 acres for the new food plot
- $.227 \times 2,700 = 613$ pounds of lime for the new food plot (Rounding creates a small difference in the actual pounds)

Nitrogen: Need 100 pounds per acre. Split the nitrogen application into 2-3 applications through the growing season.

- Convert 100 pounds of nitrogen per acre to per 1,000 square feet

continued on page 5

- Divide 100 by 43.56 ($100/43.56$) == 2.30 pounds per 1,000 square feet
- $2.30 \times 9.9 = 22.73$ pounds of nitrogen for the plot
- Split into 2 applications == 11.36 pounds of nitrogen per application
- To calculate the amount of 34-0-0 we need
 - Take the amount of nitrogen you need and divide by .34
 - $11.36/.34 = 33.4$ pounds of 34-0-0 for the new food plot

Phosphorus: Need 100 pounds of per acre.

- Convert 100 pounds of phosphorus per acre to per 1,000 square feet
 - Divide 100 by 43.56 ($100/43.56$) == 2.30 pounds per 1,000 square feet
- $2.30 \times 9.9 = 22.73$ pounds of phosphorus for the plot
- To calculate the amount of 0-45-0 we need
 - Take the amount of phosphorus you need and divide by .45
 - $22.73/.45 = 50.5$ pounds of 0-45-0 for the new food plot

Potassium: Need 60 pounds of potassium per acre.

- Convert 60 pounds of potassium per acre to per 1,000 square feet
 - Divide 60 by 43.56 ($60/43.56$) == 1.37 pounds per 1,000 square feet
- $1.37 \times 9.9 = 13.56$ pounds of potassium for the plot
- To calculate the amount of 0-0-60 we need
 - Take the amount of phosphorus you need and divide by .60
 - $13.56/.60 = 22.6$ pounds of 0-0-60 for the new food plot

I know this is a lot of math can be confusing, but don't worry. You can contact your local Clemson Extension Office and we can help you with these calculations. There is also a Clemson Fertilizer Blend Calculator located online that does many of the calculations for you. However, it does not take into account the area of your planting. This calculator can be found at: <https://precisionag.sites.clemson.edu/Calculators/Fertility/fertBlend/>



Agricultural Service Laboratory
171 Old Cherry Road, Clemson, SC 29634
Phone: 864-656-2068 Fax: 864-656-2069

Date: 1/19/2023

Lab Number:

Soil Report for:

Account:

Client Id:

Sample Id:

Soil Code:

4

Analysis Results

Soil pH 5.6
Buffer pH 7.65

Phosphorus (P) 7 lbs/acre
Potassium (K) 72 lbs/acre
Calcium (Ca) 482 lbs/acre
Magnesium (Mg) 108 lbs/acre
Zinc (Zn) 2 lbs/acre
Manganese (Mn) 96 lbs/acre
Boron (B) 0.7 lbs/acre
Copper (Cu) 1.3 lbs/acre
Sodium (Na) 9 lbs/acre
Sulfur (S) lbs/acre
Soluble Salts mmhos/cm
Nitrate Nitrogen ppm
Organic Matter % (LOI)



Calculations

Cation Exchange Capacity (CEC)	Acidity	Base Saturation					Total
		Ca	Mg	K	Na		
4.6meq/100g	2.8meq/100g	26%	10%	2%	0%	38%	

Recommendations (lbs/acre)

Crop	N	P ₂ O ₅	K ₂ O	Ca	Mg	Zn	Mn	Cu	B	S	Lime(lbs/acre)		
											Target 5.5	Target 6.0	Target 6.5
FallDeerMix, Legumes	0	100	80	0	0	0	0	0	0	0	1300	2700	
*See Comments: 1,105													
Grasses for Wildlife	100	100	60	0	0	0	0	0	0	0	1300	2700	
*See Comments: 1,105,514													
FallDeerMix,AnnualGrs	100	100	80	0	0	0	0	0	0	0	1300	2700	
*See Comments: 1,105,514													
FallDeerMix, Brassicas	80	100	100	0	0	0	0	0	0	0	1300	2700	

*See Comments: 1,105,514

Comments

1. Correct soil acidity by applying limestone at the recommended rates. Dolomitic limestone may be applied if magnesium is low. Calcitic limestone may be applied if magnesium is sufficient.
105. To convert nitrogen, phosphate, and potash recommendations from pounds per acre to pounds per 1,000 square feet (or each 300 feet of row), divide by 43.5.
514. Apply nitrogen in 2 to 3 split applications throughout the growing season.

As a land-grant university, Clemson is part of a national system created by the U.S. Congress to improve the quality of life for citizens in every state through teaching, research, and Extension. The university's statewide Public Service and Agriculture (PSA) system conducts research, Extension, and regulatory programs that improve and protect economic prosperity and well-being for all South Carolina citizens. Clemson PSA programs develop and deliver impartial science-based information in agribusiness productivity and profitability; economic and community development; environmental conservation; food safety and nutrition; and youth development and families. Clemson University Cooperative Extension Service offers its programs to people of all ages, regardless of race, color, gender, religion, national origin, disability, political beliefs, sexual orientation, gender identity, marital or family status and is an equal opportunity employer. Clemson University cooperating with U.S. Department of Agriculture, South Carolina counties. Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of May 8 and June 30, 1914. For additional Assistance for home soil report interpretation, contact Clemson Extension Home & Garden Information Center (HGIC) at 1-888-656-9988 from 8:00 am to 4:30 pm Monday through Friday.

Figure 3. The first page of the soil sample report. Image credit: Jeff Fellers, Clemson Extension.

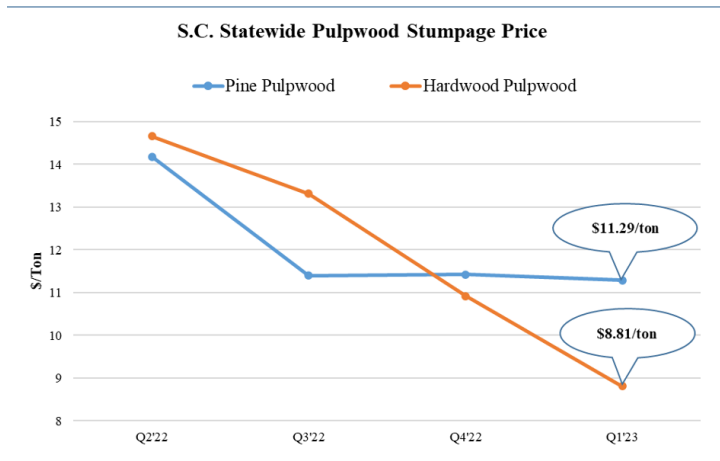
Figure 4. The second page of a soil sample report. Image credit: Jeff Fellers, Clemson Extension.

Pine and Hardwood Stumpage Price Trends in South Carolina Q1'23

By Puskar Khanal

<https://blogs.clemson.edu/fnr/2023/04/10/pine-and-hardwood-stumpage-price-trends-in-south-carolina-q123/>

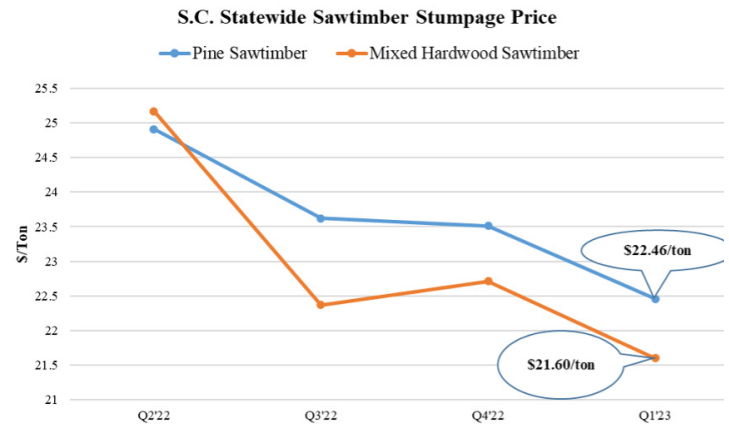
Pulpwood Stumpage Trends: In the first quarter of 2023, statewide pine pulpwood stumpage prices averaged \$11.29/ton, while the average hardwood rates were \$8.81/ton in South Carolina. It is a dramatic decline in pulpwood prices from the first quarter of last year – pine and hardwood pulpwood stumpages were selling above \$14/ton in the first quarter of 2022. Hardwood stumpage prices have declined more than pulpwood prices from the last quarter. Hardwood prices declined by 19%, while pine stumpage declined by less than 2% from the prices in the fourth quarter of 2022 (Q4'22).



Graph of S.C. statewide pulpwood stumpage price trends. Credit: Puskar Khanal, Clemson University.

Sawtimber Stumpage Trends: Like pulpwood trees, sawtimber stumpage prices also declined in South Carolina. The statewide pine sawtimber prices were \$22.46/ton, while mixed hardwood trees sold at \$21.60/ton in the first quarter of 2023. Compared with prices in

the last quarter, it is a decline of about 5% for both pine and hardwood trees. Stumpage prices for pine and mixed hardwood trees in South Carolina have declined by 9% and 10%, respectively, from the prices in the first quarter of 2022 (Q1'22).



Graph of S.C. statewide sawtimber stumpage price trends. Credit: Puskar Khanal, Clemson University.

Recent declines in both the lumber market and new housing trends due to uncertain economic environments – higher interest rates, higher inflationary pressure, and market uncertainty with the possibility of a recession in late 2023, could be attributed to a sharp downturn in the stumpage market trends from the last year. The housing market has recently seen a significant slowdown.

Data credit: The sawtimber and pulpwood price data included in this newsletter are published with permission from TimberMart-South Athens, GA 30605 email tmart@timbermart-south.com.

County Forestry Associations

Abbeville County Forest Landowners Association
Contact: Stephen Pohlman
spohlma@clemson.edu

Darlington/Florence Landowners Association
Contact: TJ Savereno
asavere@clemson.edu

Laurens County Forest Landowners Association
Contact: Jeff Fellers
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Salkehatchie Forestry Association (Allendale, Bamberg and Barnwell)
Contact: Janet Steele
jmwatt@clemson.edu

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Edgefield County Forestry Association
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Saluda County Forestry Association
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Anderson Forestry & Wildlife Association
Contact: Carolyn Dawson
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Greenville Forestry & Wildlife Society
Contact: Carolyn Dawson
dawson4@clemson.edu

Lowcountry Landowners Association (Beaufort, Colleton, Hampton, Jasper)
Contact: Amanda Taylor
ast4@clemson.edu

Sumter County Forest Landowner Association
Contact: Ryan Bean
rbean@clemson.edu

Calhoun-Orangeburg Forest Landowners Association
Contact: Janet Steele
jmwatt@clemson.edu

Greenwood County Forestry Association
Contact: Stephen Pohlman
spohlma@clemson.edu

McCormick County Forestry Association
Contact: Stephen Pohlman
spohlma@clemson.edu

Tri-county Forestry Association (Berkeley, Charleston, Dorchester)
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ast4@clemson.edu

Chesterfield County Forestry Club
Contact: Ryan Bean
rbean@clemson.edu

Kershaw County Forest Landowner Association
Contact: Ryan Bean
rbean@clemson.edu

Newberry County Forestry Association
Contact: Jeff Fellers
fellers@clemson.edu

Williamsburg County Forest Landowners Association
Contact: Tancey Belken
tanceyc@clemson.edu

Contact the Association nearest to you to find out about upcoming meetings!



Several members of our Clemson Extension Forestry and Wildlife Program Team had the opportunity to participate in a portable sawmill training last fall. Team members from left to right include: Jaime Pohlman, TJ Savereno, Ryan Bean, Patrick Hiesl, Matt Burns (Extension Leadership Team), Jeff Fellers, Janet Steele, Cory Heaton, Stephen Pohlman, Derrick Phinney. Photo credit: Kathy Coleman, Clemson Extension.

Contact our Agents:

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Dave Coyle	Forest Health and Invasive Species	
Cory Heaton	Wildlife Management	
Patrick Hiesl	Forest Operations and Forest Products	
Puskar Khanal	Forest Economics	
Marzieh Motallebi	Ecological Economics and Carbon Credits	
Stephen Peairs	Forestry, Silviculture, and Hardwood Management	

Newsletters are archived online at:
<https://www.clemson.edu/extension/forestry/resources/newsletter.html>

Newsletter edited by Jaime Pohlman and reviewed by Amanda Taylor

Clemson Extension Forestry and Wildlife Program Team-
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 College of Agriculture, Forestry and Life Sciences

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