Views From The Foothills

A Publication of the Culpeper Soil & Water Conservation District
Serving Culpeper, Greene, Madison, Orange & Rappahannock Counties
www.culpeperswcd.org

Vol. 20 Issue 2
Spring 2020

M. Johnson

Inside This Issue

Welcome!

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Silvopasture: Some "Whats" and "Whys"

By John Fike, Forage—Livestock and Biofuels Research Crop Professor, Virginia Tech

What is silvopasture?

For good communication, right understanding rests upon clear, agreed-upon definitions. Interestingly, it's often easier (or even necessary) to define something by what it's not rather than what it is. Three such "what it's nots" readily come to mind in the case of silvopastures.

Silvopasture may appear to be a new practice, but it's probably safer to say this is an old practice that we're re-learning. Cattle grazing under locust trees is a reasonable representation of practices that were common on Eastern farmsteads several decades ago. Trees were a source of poles, posts, fuel and fodder; leguminous trees such as locusts also were an important source of nitrogen in a world without industrial fertilizers.

The two other "what it's nots" of silvopasture discussed here are critical to understanding these systems in a management context. First, silvopasture is not turning livestock loose in the woods, nor is it a single tree standing in a pasture. In both cases, when livestock have uncontrolled access to trees with little to no management, several negative outcomes are likely. So if it is not these things, what then is silvopasture?

Silvopasture is the term most commonly used to describe integrated tree, forage and livestock management systems. "Silvo" references the tree or forest component and "pasture" encompasses the forage and livestock elements. Silvopasture systems can be created by planting trees in pastures or by establishing forages under thinned trees. Each of these approaches has unique demands and opportunities, but in both cases, the systems rely on the "four i" principle, in which management is intentional, integrated, intensive and interactive. All components of the system—trees, forages and livestock—are combined and under active management in order to create beneficial relationships and optimize the system's outputs and outcomes.

Silvopastures most commonly are managed so that the trees provide long-term economic returns while the livestock generate annual income. However, tree crops and products also can improve the short-term economic output of the farm system. Fruits, nuts, pods or browse can have value for human or livestock consumption– and, in

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The District carries nonwoven geotextile (filter fabric) for sale that meets most state and federally funded project requirements, as well as many on-farm needs. Geotextile is sold by the foot, which comes in 12.5' widths. Please call the Culpeper Office at 540-825-8591 for pricing and more information!

Using a soil test to inform your lawn management can yield results as seen above

Save Money with Soil Testing to Improve Your Lawn

Caring for the environment also means caring for your lawn. By using proper mowing and maintenance practices, you can enjoy a healthy, beautiful lawn while protecting local streams, rivers and lakes.

Our homes contain impervious surfaces (rooftop, patio, and driveway) that can't absorb and filter rainfall. The underlying soil characteristics of the lawn can affect how the lawn absorbs and filter the impervious runoff. Soil compaction, low pH (e.g. acid soils) and low nutrients can impact how you grow vegetation in your lawn. Improperly applied or excess fertilizer and other chemicals are not retained in the landscape, and can contribute to harmful algal blooms and other water quality problems.

What is lawn care? It's not just seeding, watering and mowing. We must amend the soil not only to feed the grass but to improve soil structure. Managing clippings and leaves are all part of lawn care too. Returning these byproducts improve the soil and vegetation. How we care for our lawn determines the degree of the environmental benefits and impacts we achieve.

Healthy lawns can help prevent erosion, reduce runoff, and filter rainwater. A healthy lawn has uniform and mature vegetation that inhibits erosion and retains nutrients. A healthy lawn can capture over an inch of rain; traps dust and dirt; convert carbon dioxide to oxygen; and reduces the heat island effect with air temperatures up to 30 degrees cooler than pavement. A sparse lawn with bare soil needs improvement either by amending the soil or selecting different landscape plants.

The soil should be tested every three years. A composite soil sample of the whole yard is collected. A soil test includes information on the amount of nutrients, organic matter and pH level. The proper balance is essential to a healthy lawn. Additional assessments of patchy bare spots could be done to verify foot traffic, recent disturbance, disease or standing water.

The Culpeper Soil and Water Conservation District is working with your local Extension agent to make sure homeowners like yourself have the knowledge and resources to do your part. The District is offering a voucher to cover the cost of the soil test. For these vouchers please contact the District at 540-825-8591 or stephanieD@culpeperswcd.org.

For more information on lawn care see the Virginia Extension Publication list: https://www.pubs.ext.vt.edu/tags.resource.html?tag=pubs_ext_vt_edu:lawns .

Pond Alert!

Did that get your attention? That was the plan. Ok, not really an alert, at least in the short term but certainly a "heads up" for any pond owner. The Culpeper Soil and Water Conservation District regularly receives calls from property owners regarding a multitude of pond issues or problems. We regularly provide site visits and full assessments of the pond and pond site, and provide any prescriptive suggestions for resolving problems either biological, chemical or physical and either aquatic or terrestrial. At times we suggest you contact a professional with a deeper understanding of some topics and we maintain a contact list of many of these professionals. So…..Back to the reason for the "alert". Trees on dams.

This is a topic that most often arises when we do site evaluations because the dam of the pond is already leaking like a sieve, or because the property owner simply asks about the trees, or because we notice that the tree growth has established itself on the dam and the situation is heading way in the wrong direction, or…….many reasons. So here is the bottom line. If you don't have any trees on your dam don't get any. That's right; none. If you want trees, plant them or let them grow upstream along the pond or lake, not on or near the dam. If you already have trees on your dam then some careful consideration is in order. Where on the dam are they located, how big are they, and to some extent, what species of tree are they?

So, why not trees. Because an ounce of prevention is most always worth a pound of cure and the hazards from the trees are several. First off, the roots of trees will grow through the dam, either direction, and cause "internal piping ". That is, water finds it way along the roots and creates flow paths along them and the pond begins to leak. This can happen at any elevation on your dam embankment but more prevalently occurs lower down. But not always. We have seen dams leaking up near the crest and leaking badly. So reason one; trees cause dams to leak and lose water and the dam itself becomes less structurally sound. Structural integrity becomes very important when the pond totally fills up due to heavy rains. Reason two; trees can be blown down in the wind and the root ball rip a big hole in the dam; either side of embankment. This can cause both leaking and embankment instability. It's not a sure thing but it can happen. Reason three; trees create a lot of shade which can be a good thing but it also inhibits the development of a good sod grass cover on the embankment; the much preferred vegetation for a dam embankment. The sod provides good protection for the soils and dam in the event of flooding.

So, you've got trees on your embankment and you're wondering, what now. The official "textbook" prescription is to remove them, grub out the root system down to about 1 inch diameter and refill the void with well compacted clay based soil, reseed, fertilize and mulch. So, if you have a lot of trees and they are large, then this might be looking at a full rebuild of the embankment or nearly so. Costly, yes, we have seen this many times and many times while the embankment was already leaking. Beyond that textbook prescription and based on your situation, there are choices.

Conversely to the former "trees cause leaking" examples, we have seen old embankments with big trees that are not causing leaking. Our suggestion for these latter situations is that if they have existed for this long and not caused any leaking then just leave well enough alone. You do still run the risk of windfall but you can evaluate the site and tell if it is overtly in the path of winds or more sheltered in location. And if it happens then deal with it then. It should be noted here that the risk of cutting down any trees without grubbing the root system, regardless of tree size, is that the old roots will die and decomposed and allow internal pathways to form where water may flow. So, if you cut the trees (anything 3 inches in diameter or greater) you should grub the root system.

One of the worst pond situations we have seen (many times) is with willow species growing on the water side of the dam, near or along the water line. For some reason this seems to cause worse leaking than when they are on the downstream side of the dam but neither is good. It's not unique to willows; any fast growing woody species seems to have more or less the same effect. They grow right thru the dam and the downstream face of the dam becomes like a waterlogged sponge; squishy under foot. It's not

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Cost Share Program Still Available to Address Emerald Ash Borer

By Meredith Bean, Virginia Department of Forestry

The Emerald Ash Borer Cost Share Program is back for 2020! This reimbursement program offers aid to individual landowners, municipalities, homeowners' associations, universities, non-profits, etc who are seeking to protect high-value ash trees from the destructive Ash Borer. Reimbursements are 50% of direct treatment costs (injection treatments of emamectin benzoate only) up to $1,250 per landowner and $5,000 per organization. Enrollment is open now until June 23rd but the Department of Forestry will be flexible with timing and method of submission given the current pandemic.
Questions? Please contact Meredith Bean, Emerald Ash Borer Program Coordinator at Virginia Department of Forestry via email: Meredith.bean@dof.virginia.gov or 434-262-0520.

Links:
Application form: www.dof.virginia.gov/forms/f06.05.pdf
Application process: www.dof.virginia.gov/health/EAB-Application-Process.pdf

Invasive Species are Killing Blue Ridge Trees

Report Summary from Smithsonian Conservation Biology Institute

"Within our long-term monitoring plots, exotic forest insects and pathogens were associated with notably elevated mortality rates and steep declines in abundance and above ground biomass."

Invasive insects, fungi and bacteria can cause severe damage to tree species. A prime example is the widespread destruction of North American Ash trees by the non-native Emerald Ash Borer. Non-native insects and pathogens are commonly found in temperate forests; however, their long-term impacts on tree mortality, carbon sequestration and forest composition are relatively understudied. A new study from Kristina J. Anderson-Teixeira and colleagues from the Smithsonian Conservation Biology Institute examines how a multitude of exotic pests affect the forest ecosystem on a large spatial and temporal scale. The study analyzes data that spans 3 decades (1987-2019) and 29.4 hectares from the North American Blue Ridge Mountains. The study site is within a largely forested region and includes plots in Shenandoah National Park and the nearby Smithsonian Conservation Biology Institute. Researchers found that exotic forest pests significantly disturbed about 24% of tree genera and were linked to the loss of 21-29% of tree biomass due to mortality. These losses in biomass and biodiversity, however, were compensated by the growth of other native trees. The results of this study recognize exotic insects and pathogens as significant forces in shaping forest ecosystems. The impact witnessed within the study site is likely representative of other nearby temperate forests. Continued monitoring of exotic insects and pathogens while limiting their spread will help to protect forest health and biodiversity.

Drinking Water Testing Clinic for Residential Wells

Residents and landowners in Culpeper, Fauquier and Rappahannock are eligible for a clinic to test your well water. Contact Becky Sheffield at Rebes13@vt.edu or 540-727-3435. Location TBA. The dates are:

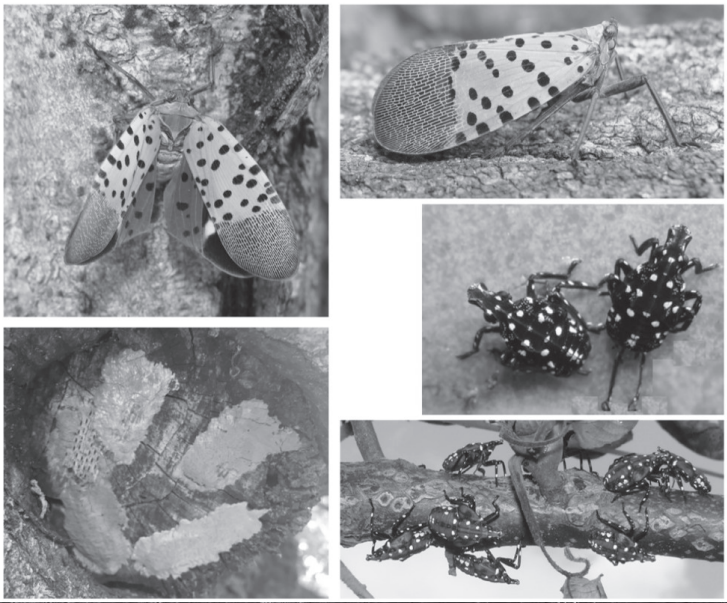
- Kick off: October 7
- Drop off samples: October 14
- Results meeting: November 12

Spotted Lanternfly Look out!

Please be on the look out for the egg masses of the Spotted Lantern Fly (SLF). The first egg mass found was one year ago today near Winchester. In less than a year, it's spread now includes Virginia's Clark County and Berkley County, WV. It was also confirmed for the first time in Cecil County, MD last year. This is the most effective time of year to do something positive about this situation.

1. If an Egg Mass is found in a new area, report it
2. If an Egg Mass is found in a known area, destroy it (because each egg mass is 30-50 new adults by the summer)

Go to this site for more information and join the squash and Smash SLF Army! https://ext.vt.edu/agriculture/commercial-horticulture/spotted-lanternfly.html



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the case of pines, baling needles for straw mulch may provide added farm income.

Other desired functions or outputs of silvopasture management may include shelter or heat stress abatement for livestock, improved resource use through greater light and nutrient capture, reduced erosion, wildlife food and habitat and risk reduction (through farm diversification). Whatever the rationale for implementation—and whatever system is implemented—management is the fundamental requirement for success.

Silvopasture in resource optimization

Questions often arise regarding negative interactions that can occur when trees and forages compete for the system's resources, especially light, water and nutrients. The following sections address some of the resource issues and explain system functions in relation to these resources.

Light

From the latitudes of the mid-south and northward, cool-season grasses are the primary species for forage livestock systems. Although species differ in productivity in response to shade, all cool-season grasses are light-saturated at less than full sun. If managed with available light in mind, adding trees to pasture systems does not have to "tank" forage production and in some cases moderate shading can even increase forage yield. Tree species selection and management play important roles in these dynamics.

Temperature

Although trees may reduce available light to the forage canopy, there can be positive trade-offs. Forages under trees often green up sooner in spring because of the buffering effects trees have on the forage microclimate. Trees also can have energy-sparing effects on forages; cooling from shade reduces the costs of maintenance during periods of excessive heat or during large swings in temperature. In this way, effects of lower light can be partly offset by lower plant respiration. Lower temperatures can also have positive effects on forage nutritive value and digestibility.

Moisture and nutrients

Tree-forage interactions often are assumed to be negative in terms of soil moisture and nutrients. However, the nature of these interactions depends on multiple factors, including aspect (the direction the slope faces), soil type and depth, tree and forage rooting depths and tree and forage water and nutrient use efficiencies.

The lower temperatures and reduced wind speeds caused by trees decreases evaporation and transpiration losses. Trees also play an important role in nutrient cycling, accessing nutrients deep in the soil and moving them to the surface via leaf drop. Trees also can increase the system's nutrient use efficiency by capturing nutrients such as nitrogen that are readily leached below the forage root zone—and this in turn supports more rapid tree growth.

Animal production from Silvopastures

Many studies have shown that tree shade improves livestock performance and behavior, but data on animal gain in actual silvopastures where trees are broadly distributed are few, particularly in temperate deciduous systems. Animal performance was not reduced in an early stage mixed pine-walnut silvopasture system in Missouri, despite a 20% reduction in forage production and we have seen similar results in Virginia. Increased forage nutritive value and energy-sparing effects of a more comfortable environment likely are the primary factors that support comparable rates of gain between systems where forage yield reductions are observed.

Environmental outcomes

Silvopastures provide opportunity to make environmental gains, whether by planting trees or thinning stands. Thinning existing stands can be a path to rehabilitating forests degraded from past abuses—whether through high-grading harvest practices ("taking the best and leaving the rest") or animal mismanagement.

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Timber stand improvement practices can be used to select and manage for preferred species and to remove reservoirs of non-native invasive tree and shrub species. Adding forages to the understory can heal eroded lands scarred from years of unmanaged livestock access. Similarly, planting trees provides opportunity to reduce runoff and erosion, and the added comfort for livestock can reduce their use and degradation of surface waters.

The system as a whole

Managing trees, forages and livestock on the same piece of ground represents a set of challenges and opportunities beyond that found in monocultural ("forage-livestock" or "tree-only") systems. Even if joining these production systems results in some reduction of each component, the overall combined output of the system can be greater than systems managed as monocultures. Additionally, silvopasture management can be strategically deployed as a part of the whole-farm system to mitigate stresses to livestock or improve environmental outcomes with an eye toward greater profitability over the long term.

Producer adoption and the long view

Silvopastures are not for everyone. They require new skill sets and greater management inputs than needed for typical forage systems. They also require a long view. A common first reaction to the idea is "I'm not going to harvest those trees, so why should I plant (or manage) them?" This can be answered both from economic and "land ethic" bases. First, the value of a tree can be sold or bequeathed, whether a tree is ready for harvest today or tomorrow. Second, as with Johnny Appleseed (who planted trees for others), our goal as stewards should be to leave the land better—the woodpile higher—for those who will follow. Silvopastures present such an opportunity, and growing interest in these systems is an indicator that more land owners and managers are recognizing it.

Conservation Incentive Programs

Available in the Culpeper Soil & Water Conservation District Updated December 2019

Program	Cost Share Rate to Establish Practices	Agreement Period	Requirements	Annual Rental and Other Payments	Other Cost-Sharing	Where & When to Sign-Up
Environmental Quality Incentives Program (EQIP)	Up to 90% of estimated costs	2-10 years Must be part of conservation plan	Threat to soil, water, air, and related natural resources on land	None	VA BMP Cost Share Program	FSA or NRCS
Reforestation of Timberlands (RT)	Up to 75% of estimated costs	10 years	Water quality BMP's must be installed. Pines only. 100-acre maximum.	None	None	VA Department of Forestry
U.S. Fish & Wildlife Service Partners for Fish & Wildlife	75% to 100%	10-year-minimum	Priority areas include Upper James, Upper Roanoke, Upper Tennessee watersheds	None	VA BMP	Culpeper SWCD USFWS
Virginia BMP Program	60-100% plus incentives	5 - 15 years	Existing water quality problems	Yes for buffers	Some areas	Culpeper SWCD
Virginia BMP Loan Program	Zero interest loans – no maximum.	Up to 10 years	Must be an eligible practice	None	None	Culpeper SWCD
BMP Tax Credit Program	25% of out-of-pocket expenses	5 - 10 years	Existing water quality problem	None	BMP Program	Culpeper SWCD
Emergency Conservation Program (ECP)	50 - 64%	10 years	Damage to agricultural production due to declared agricultural emergency	None	None	FSA When announced
Conservation Reserve Program (CRP)	No more than 50%; varies by component	10 or 15 years	Vary according to practice	Varies based on soil types	None	FSA
Conservation Reserve Enhancement Program (CREP)	No more than 50%; varies by component	10 or 15 years	Vary according to practice	Varies based on soil types Various additional incentives available	SWCD	FSA
TMDL Ag BMP Program	50-85% depending on the practice	10 years	Stream exclusion projects with 10-35 foot setbacks in selected watersheds	Optional bonus payments per foot for fencing in selected watersheds	None	Culpeper SWCD
TMDL Septic Cost Share Program	50-80% depending on income	5-10 years	Inspections, pumpouts, repairs or replacements of septic systems in selected watersheds	None	None	Culpeper SWCD
VA Conservation Assistance Program (VCAP)	75% of costs	10 years	Problems with erosion, poor vegetative cover & impervious runoff. Existing Homes more than 3 years old are eligible	None	None	Culpeper SWCD
Agricultural Land Easement (ALE)	Easement purchased	Permanent easement	Open space easement; requires a partner agency to provide funds and hold easement	None	State program options	NRCS
Wetland Restoration Easement (WRE)	100% of wetland restoration costs plus cost to obtain easement	Permanent easement	Area must meet criteria for wetland restoration	None	None	NRCS

Web Soil Survey

Soil science integrates scientific principles from physics, biology and chemistry to illuminate how soils provide a myriad of essential services to not only the human population but to at least all of terrestrial life here on the planet. It provides an understanding of how soil properties relate to and can be managed for optimal agricultural production, forest, range and wetland management, land development planning and urban land use, global biogeochemical cycles, ecosystem function and much, much more.

Soil scientists research soil chemical and microbial processes, geochemical and physical processes, map soil characteristics and provide a technical and scientific background for all the ways we use soil. The study of soil science is not a static thing; new research on a multitude of fronts continues year after year. For example; did you know that many if not most of the antibiotics we rely on to maintain our health were derived from soil microbes? Yes it's true.

Huh, did we mention soil mapping in there somewhere? If you haven't already you can educate yourself on your own soils right there at home. Just follow these simple instructions and get introduced to Web Soil Survey from USDA: https://websoilsurvey.sc.egov.usda.gov.

1. Click on the green "Start WSS" green button.
2. On the left pane under "Quick Navigation" select State and County then click on "View."
3. Click on the + magnifier found at the upper left top of the map section.
4. Using the left mouse held down, draw a rectangle around the approximate location you are looking for and then release the mouse and the screen will zoom in closer.
5. Repeat step 5 until you get a good zoom on the area you are interested in. You may need to use the "hand" icon at the top of the map section to move the map and center it on your screen.
6. Click on the Area of Interest (AOI) icon at the top of the map. Either icon will work. Pick a spot of the map that is approximately at the northwest corner of your area of interest; maybe even a little outside the area is better. Holding the mouse button down and drag the line to form your Area of Interest.
7. Now go to the top of the screen and click on "Soil Map." You will now see your soils mapped and identified with some preliminary information about each soil identified as present in your AOI. Clicking on any individual soil names in the left side pane will give you even more information on your soil. Information about various layers of soils and soil types going down deep below your AOI, including limitations due to bedrock or underground water, flooding and ponding. Feeling smarter yet? It gets better.
8. Now close out that "Map Unit Description" pane that recently opened and go up top again and click on "Soil Data Explorer." On the left pane you can choose any of the many "Suitabilities and Limitations" reports. For practice we suggest you click "Water Management." The click "Pond Reservoir Areas." Then you can click on "View Description" so you can better understand the ratings you will read next. So, digest this information. Then click on "View Ratings" and you will get a rating for each soil in your Area of Interest.
9. Ok, that is basically it. There are other ways to approach the use of Web Soil Survey but this illustrates the basic use of the tool. One can learn a lot just with this simple lesson. Anyone wishing to get a more site specific, detailed analysis for any envisioned use would do well to hire a professional soil scientist.

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unique to the fast growing species but they seem to be the worst. Tress below the dam may also cause leaking although it requires a case by case evaluation and may not be quite as obvious.

So, again back to the "alert." The intention of this article is not to give a long analysis of the many options to mitigate trees on dams, evaluate the impact of different species, nor a technical treatise. Mitigation of trees on dams requires a site by site evaluation and a case by case decision the landowner must be comfortable with. The intention here was to be brief and to the point; alert you and maybe prompt you into not allowing trees to become established on your dam. It is SO much easier. Trees have been and still are very much THE ANSWER as the saying goes. So plant trees, maybe even lots of them, and enjoy them. They are a very amazing part of biology here on the planet and provide many, many benefits to you, your land and environment. Just not on dams.

RAIN BARREL SALE!

Rain barrels are available! Prices are $75 for one and $140 for two. For more information, contact Stephanie DeNicola at 540-825-8591 or send an email to: stephanied@culpeperswcd.org.

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Published Seasonally By
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