

WISCONSIN SILVOPASTURE RESEARCH BRIEF

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What we did: Silvopasture listening sessions

In February 2026, we gathered 38 farmers, conservationists, and researchers across three different regions of Wisconsin to talk about opportunities and challenges in silvopasture, silvopasture design features, and research needed to support producers and program administrators.



Motivations and challenges in practicing silvopasture shared by participants

The participants of the listening sessions shared their stories about engaging with silvopasture – either actively practicing silvopasture on their farms, considering silvopasture implementation, or providing program support and technical assistance to growers implementing silvopasture.

Motivations for practicing silvopasture included:

Sustainable Landscapes and Livelihoods Lab, visit <https://castlelab.cals.wisc.edu/> for updates.
UW-Madison Department of Forest and Wildlife Ecology

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Ecological benefits – “I don't raise beef, I raise soil engineers” (NW WI grazier)

- Silvopasture by subtraction is often used to control exotic/invasive species
- Livestock, cultural fire, and selective tree removal to help restore cultural and historic oak savanna-type landscapes
- Trees in pasture can help conserve soil moisture and reduce soil erosion.
- Increased overall farm biodiversity and ecological services.
- Improving woodland and pasture health achieves both ecological and economic goals, “be profitable and give back to the earth”.

Economic opportunities

- Improved access to woodlands helps to utilize marginal land and scale their farm system
- Converting appropriate woodlot (see design criteria below) to Wooded Pasture may lower tax burden of recreational forest land (if meeting pasture criteria).
- There is potential to diversify income revenues through grazing rental, animal meat, forest products (timber, firewood).
- Silvopasture tends to use less inputs and machinery, which offers potential cost savings.

Livestock as helpers

- Livestock can help biologically control invasive species in woodlands.
- Well managed livestock traffic can help improve forage seed contact with the soil.

Social connection and personal satisfaction

- Silvopasture offers opportunities to educate and engage the public and work with conservation agencies.
- Reduced chemical use is better for the local ecosystem and personal health.
- Increased access to woodlands creates recreational pathways for personal and family use.

Benefits from trees and woodlands

- Growers saw opportunities to improve forage quality, productivity, and availability.
- Livestock wellbeing and product quality from access to shade and less disease pressure.

Challenges shared by our listening session participants included:

Silvopasture is a long-term project that requires time and effort to both establish and keep it going in the long term. Careful research and support from professionals and peers with experience implementing silvopasture can be essential to finding success.

Lack of technical and financial assistance

- Silvopasture by subtraction is not currently eligible for fencing and water cost-share.
- Need more silvopasture demonstrations for farmer-to-farmer learning.

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- Currently, silvopasture education and training for technical service providers is limited.

Ecological conflicts - “If you put cows in the woods and have one bad day, the effects can last much longer” (NW WI grazier)

- Planting trees in pasture can negatively impact grassland bird nesting (minimum patch size is 40 acres for grassland bird habitat).
- Mismanagement of livestock in woodlands risks soil compaction and erosion.

Economic challenges

- Establishing silvopasture through buying tree stock, tree protection, thinning forests, seeding forage, and setting up fencing and water can be challenging and cost prohibitive.
- Cost share programs favor silvopasture by addition.
- Installing and moving fencing within woodlands has its own unique challenges.
- Timber production profitability depends on woodlot size.
- Tree food crops from silvopasture are difficult to sell due to nascent market development for some species as well as the FDA Final Rule on Produce Safety.

Management complexity

- Long-term and dynamic management of silvopasture “requires double the expertise” in grazing livestock both on pastures and in forests.
- Livestock stocking density will change over time with changes in tree canopy and potential forage yield loss from shade.

Design challenges (see Site Suitability and Design Features sections for recommendations)

- Selecting an ideal site with suitable soils, topography, water access is paramount.
- Forage, tree, and livestock selection requires finding species compatible with shade, animal disturbance, and fire (where applicable).
- Choosing the right cover types where both forage and biodiversity benefit is challenging.
- Need to match livestock type with tree spacing and protection.
- Virtual collars may help silvopasture adoption but are expensive and may not get adequate reception in woodland areas.

Social disagreements

- Silvopasture by subtraction can attract negative attention, “People don’t like seeing trees removed” (South Central WI grazier).
- Mismanaged cows in the woods reflects poorly on silvopasture as a practice.

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Before Adopting Silvopasture

- **Understand your site.** Inventory your soils and plants, understand how climate and weather affect your land, locate existing and needed infrastructure, map out water access, identify critical areas (stream banks, rare species) to exclude livestock from, assess pasture and woodland quality.
- **Define your overall farm goals.** Silvopasture needs to fit within the economic and practical goals of the land operator. Species selection and management strategies need to be aligned with operator's priorities and access to markets.
- **Create grazing, forestry, financial, and emergency plans.** Successful silvopasture requires advanced and detailed plans for all dimensions of the farm enterprise.
- **Get experience.** Silvopasture is a complex system that requires a land manager versed in animal husbandry, pasture management, and forestry. Before beginning on your own land, learn from nearby and exemplary silvopasture farmers.
- **Increase silvopasture incrementally.** Start small and gradually increase acres of silvopasture as is appropriate for your land base and labor availability and expertise.

Economics, Tax Incentives, & Land Access

- **Land access and tenure:** For beginning farmers, renting land often makes more financial sense than trying to buy enough acreage. Land sharing opportunities and need to find continuous acreage to implement silvopasture across. There is interest in creating 5+ year, low-cost grazing contracts on "marginal" parcels owned by non-operating or recreational landowners. Link new and beginning farmers with land suitable for silvopasture. Some landowners manage woods with cattle specifically to maintain and improve deer habitat for hunting or leasing.
- **Improving value of marginal land:** Land with early successional or degraded forests is often more affordable, but less suitable for row cropping or as pasture. Silvopasture offers a potential pathway to support livestock-based revenues, while also improving the quality of the woodlot for future timber harvesting.
- **Tax designation:** Moving land from a "protective forest" designation to a "productive pasture" designation can reduce a landowner's tax burden. "Fencing in 40 acres has completely paid for itself after 4-5 years in tax savings alone." (NW WI grazier). Silvopasture is not allowed on acres under WI Managed Forest Law agreements.

Prioritized Research Agenda & Data Needs

- **Economics research:** Quantify the return on investment of silvopasture vs. traditional forestry or row-cropping. Silvopasture risk management guidance. Economics of silvopasture by subtraction versus running forest grazing.

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- **Ecological research:** Research and outreach to counter the historic forestry assumption that "grazing woods is always bad." Carbon sequestration research (e.g., for carbon market integration). Silvopasture fire management and disturbance regimes. Impact of silvopasture on bird species, including rotational grazing strategies (timing and intensity) and nesting success, patch size needed for bird species. Effectiveness of livestock on managing invasives over the long term.
- **Canopy cover-forage-livestock research:** Localized data correlating specific canopy cover percentages with forage productivity and quality. Nutritional balance of silvopasture as compared to open systems. Livestock species-specific best practice guidance.
- **Management techniques:** How to optimize the planning, implementation, and long-term management of silvopasture by addition and subtraction (planting strategies, tree protection, pruning, livestock rotation, stocking index, forage establishment and management, weed management, pest and disease management). Managing for wildlife (e.g., deer).
- **Regional Suitability Assessment:** Identify priority regions for expanding silvopasture practice based on economic, ecological, market, and production research.
- **Policy research:** Exploring how to get silvopasture officially recognized in tax laws.

Outreach, Education, & Future Action

- **Updated Training for Professionals:** Traditional forestry and agency staff (NRCS, Extension) need updated, modern training on silvopasture-specific management and conservation implications.
- **Locally Relevant Publications:** Short, regional guides focusing on forage production, economics, and complex-systems science with best management practice recommendations.
- **Peer-to-Peer Mentorship and Producer-led Groups:** Establishing formal mentorship networks where experienced silvopasture grazers can advise beginners. Opportunities for forming silvopasture grazer networks, meet-ups, and producer-led groups.
- **Demonstration Sites, Communication, Advocacy, and Promoting silvopasture:** Visible demonstration sites are essential to showcase "potential success" to skeptical neighbors, agency staff, and loggers. Field days to bring producers together and demonstrate practices. Changing silvopasture practice standards and knowledge within agencies.
- **Collaboration:** Collaborate with existing and allied organizations.

SILVOPASTURE BY ADDITION



1. Silvopasture By Addition Site Suitability: Where (and Where NOT) to Implement

Successfully implementing silvopasture requires knowing your land and landscape – the context matters, and the goals of the land operators matter! The group identified clear indicators for where silvopasture by addition (planting into pasture) makes the most sense.

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Favorable Sites & Indicators (+)

- Marginal lands not suitable for cropping, or pasture where no shade is currently available.
- Parcel shape not conducive to machinery (e.g., for hay).
- Existing management style of grazer is compatible: High-intensity, short-residency grazing.
- Ecologically suitable, including designs to support grassland birds or create habitat for woodpeckers via snag creation/girdling. Tree planting and grazing addressing specific ecological need (e.g., soil erosion)
- Sites with slight slope that could benefit from tree planting. Sloped land better for orchard planting due to air drainage. North and east side of slopes best (do not dry out as much, so it is easier to establish trees). Drought-tolerant species like oaks and hickory work best for south and west facing slopes.
- If planting tree crops, smaller scale farms may have an advantage in terms of managing diverse systems and income sources. Need additional pasture area for livestock available leading up to and when harvesting tree crops.

Unsuitable Sites & Warning Signs (-)

- Streambanks, wetlands, springs, & swamps should be avoided to protect water quality, reduce erosion, and prevent livestock health issues like foot rot and liver flukes.
- Bottom ground (flat lands near water) should be avoided when possible.
- 1st grade tillage soils may be more suitable for crop production than silvopasture, but this depends on your goals.
- Areas with rare species.
- Poor Management Fit: goats and pigs are difficult to manage alongside trees planted in pasture.
- Avoid interfering with grassland restoration efforts. Grassland birds are particularly sensitive to continuous, linear tree plantings.

2. Silvopasture by Addition System Design & Establishment Steps

Transitioning an open pasture to a functioning silvopasture requires intentional tree species selection, tree protection over the first few years, and grazing management plan.

Recommendations for transitioning to silvopasture by addition

* Land Preparation

- **Soil:** Use soil amendments and build soil quality over time. Consider moderate terraforming (swales, keyline plowing) for passive water management.
- **Inputs and Materials:** Fertilizer, tree tubes, stakes, plant materials, mulch, irrigation, livestock fencing.
- **Exclusion & Fencing:** Fencing livestock out of natural water bodies is crucial. Ensure a robust perimeter fence is established early. Virtual fencing can be a helpful tool for optimizing utilization.
- **Water Access:** Secure a reliable water source (e.g., water line, well, or creek).

* Species selection

- **Livestock species:** Sheep without horns may be gentlest on young trees but need to be rotated every 2-3 days – may be appropriate in early establishment years. Cattle introduction once trees are established, unless using high-quality fencing system. Pigs and chickens may be more difficult to integrate; goats are particularly challenging.
- **Tree species:** May select tree species for human consumption, timber, shade only, or supplemental forage nutrition (e.g., foliage, mast, fruit). Anecdotal evidence that some tree forage (e.g., nuts, mulberry fruits and leaves) may improve quality of animal products. Poplar may be planted for quick shade and as a nurse species for slower growing hard woods. Native, long-lived species are ideal, like oak (wide-branching, acorn production), sugar maple (syrup production, though may be toxic to some livestock species), mulberry, northern pecan or hickory-pecan hybrid.
- **Grass Species Selection:** Broadcast past seeds of both native prairie and non-native shade-tolerant species (e.g. orchard grass). Additionally, plan to tap into and manage the existing seed bank of native forbs, when present.

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* Tree Planting, Fencing, & Water Infrastructure

- **Tree Planting:** Wider spacing allows for easier fence movement (e.g., 20-50' between trees) if planting for shade. Closer spacing if planting for tree crops (e.g., fruit, nut, timber production) and must be in straight rows. Try to plant on the contour for optimal water management. Choose tree species that offer up to around 50% dappled shade to improve pasture growth near trees. Plan for some tree mortality during establishment.
- **Water Access:** Secure a reliable water source (e.g., well or creek).
- **Exclusion & Fencing:** Fencing livestock out of natural water bodies is crucial. Ensure a robust (“hog tight”) perimeter fence is established early. Protect individual trees with tree tubes or fences compatible with livestock browse height. For small livestock, use electro-netting. Virtual fencing can be a helpful tool for optimizing utilization, but is expensive and may have challenges.

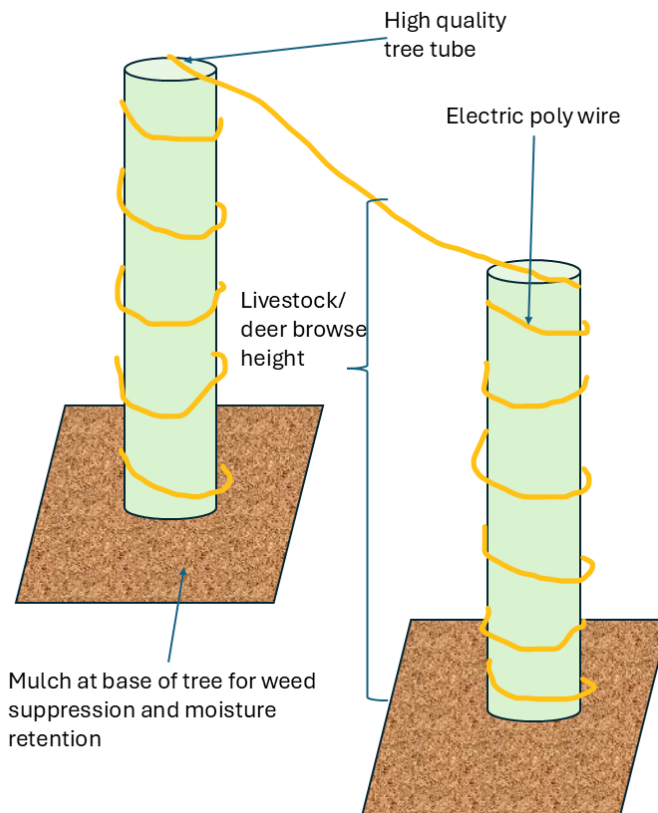


Figure 1. A schematic illustration of a tree protection strategy employed by the Savanna Institute in Spring Green, WI, where electrified poly-wire is wrapped along the vertical length of each tree tube as well as across the top. This system prevents large livestock from disturbing the tree tubes. Horizontal sections of poly-ware can be set above the height of livestock to allow animal movement between rows of trees.

SILVOPASTURE BY SUBTRACTION



1. Silvopasture by Subtraction Site Suitability: Where (and Where NOT) to Implement

Successfully implementing silvopasture requires knowing your land and landscape – the context matters, and the goals of the land operators matter! The group identified clear indicators for where silvopasture by subtraction (thinning woods) makes the most sense. One of the key opportunities shared by participants was to convert degraded sites back to an oak-savanna type ecosystem.

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Favorable Sites & Indicators (+)

- Degraded woodlots & plantations have high potential for restoration and active management.
- "Legacy Pastures" with woody regeneration that were historically grazed (e.g., in the 1920s–1940s) and are "non-croppable," have high potential. Fairly open grown forests are easier to convert.
- Fire-Dependent/Tolerant Species, i.e., stands dominated by Oak, White Pine, Red Pine, or Jack Pine.
- Geographic location: Woodlots directly adjacent to existing open pasture allow for rotational grazing management with short residency times in wooded areas.
- Access to water source for livestock is critical.
- Existing management style of grazer is compatible: High-intensity, short-residency grazing that mimics natural disturbance.
- Ecologically suitable, including designs to support grassland birds or create habitat for woodpeckers via snag creation/girdling.
- Manageable woodlot size relative to stocking index.
- Inexpensive land provides opportunities for young/beginning farmers to silvopasture.

Unsuitable Sites & Warning Signs (-)

- Healthy, high-quality natural/managed woodlands should be left intact. Profitable timber woodlands that are already well-managed may not be ideal for silvopasture conversion.
- Flat, high-quality soils that would be more profitable as crop land.
- Streambanks, wetlands, springs, & swamps should be avoided to protect water quality, reduce erosion, and prevent livestock health issues like foot rot and liver flukes.
- Excessively rocky areas or highly steep slopes.
- Sensitive Understories: Areas with delicate spring ephemerals or rare plants.
- Poor Management Fit: Systems relying on long-residency grazing (leaving cows in the woods for extended periods) or inappropriate livestock selection.

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2. Silvopasture by Subtraction System Design & Establishment Steps

Transitioning a woodlot into a functioning silvopasture requires a phased, deliberate approach to manage light, forage, and livestock.

Recommendations for transitioning to Silvopasture by subtraction/removal

* Land Preparation & Clearing (especially important if seeding forage)

- **Debris Removal:** Use skid steers or tractors to push stumps, rocks, and debris into piles or haul out. Consider burning cleared brush on-site to create biochar, returning carbon directly to the soil.
- **Understory Regrowth Control:** Once cleared, manage aggressive woody regrowth immediately. For example, if goats are used as part of the land preparation strategy, they need to be used with relatively high frequency over multiple years, even better if in combination with forest mowing and herbicide for effective understory management (though these strategies have tradeoffs in terms of preserving native seedbank and soil compaction). If cattle aren't brought in soon enough, the understory will quickly rebound.

Note: Goats alone may be insufficient to manage invasives like multiflora rose and buckthorn since they do not necessarily kill the shrubs. Additionally, if they are not rotated frequently, they may damage the bark of desirable trees leading to unintended tree mortality. Intensity matters to success!

- **Management:** Consider multi-species grazing (adding goats or sheep) or bale grazing to target and trample tough understory regrowth.

* Canopy Thinning

- **Phased Cut:** Reduce canopy cover gradually (e.g., starting at 70% and thinning down to 50%) to prevent shocking the remaining trees and windthrow. A slower transition allows the remaining trees to harden rapidly whereas thinning leaves them vulnerable to wind.
- **Tree Species Management:** Select and protect high-quality crop trees to keep for the long term. Improve regeneration by selecting and protecting promising young trees (e.g., 5-6" diameter range) to ensure the next generation of the canopy. Can eventually add orchard trees along the regeneration plan.

* Species Selection, Forage Seeding, Fencing, & Water Infrastructure

- **Forage Species Selection:** Broadcast shade-tolerant species like orchard grass. Additionally, plan to tap into and manage the existing seed bank of native forbs, when present.
- **Planting design for forages:** Avoid and protect sensitive areas, especially where threatened or endangered plants or animals, spring ephemerals are present.

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- **Livestock Species:** Goats are useful with initial understory management. Need to rotate them frequently. After initial understory management, switch to cows (highland cows were suggested) – cows can help maintain disturbance regime to continue understory control. Know your land! Do not graze longer than available forage can support.
- **Water Access:** Secure a reliable water source (e.g., water line, well, or creek).
- **Exclusion & Fencing:** Fencing livestock out of natural water bodies is crucial. Ensure a robust perimeter fence is established early. Virtual fencing can be a helpful tool for optimizing utilization.

Long-term Management of Silvopasture

Once silvopasture by addition or silvopasture by subtraction have been fully established, the long-term management strategies converge, where both tree thinning and planting occur to match the site conditions and management plans.

Planning for regeneration:

Retain and protect young trees of desirable species to ensure the continuous regeneration of the canopy. Select for diversity, perhaps even including some “weed” trees in case high priority trees are compromised (e.g. oak wilt).

Thinning strategies:

Once trees begin maturing, you will need to implement a thinning and harvest cycle. Have contingency plans; keep varying ages of trees in your silvopasture stand with diverse tree species.

Adaptive management:

Respond to the unique conditions of your site. Ongoing cycle as tree stand, livestock population, invasive species population, and wildlife pressures change. Animal stocking rates and grazing duration will vary across years as tree canopy changes interact with pasture growth. Monitoring the conditions of the silvopasture and responding to changes allow for optimal long-term management and improved rotational grazing cycles.

Stay Connected and Keep Learning!

- **WI Silvopasture Google Group** silvopasture@g-groups.wisc.edu
- **Savanna Institute**
 - <https://www.savannainstitute.org/silvopasture>
 - <https://www.savannainstitute.org/perennialaf-dos-and-donts-of-silvopasture-by-subtraction/>
- **UW Extension**
 - “Establishing Silvopasture in Existing Woodlands”
<https://cropsandsoils.extension.wisc.edu/articles/establishing-silvopasture-in-existing-woodland/>
 - “Renovating Forests for Silvopasture”
<https://www.youtube.com/watch?v=6B92VSntYsA>
- **Northwest Graziers Network** <https://nwgn.mailchimpsites.com/>
- **WI Farmers Union** <https://www.wisconsinfarmersunion.com/>

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Author Information

The WI Silvopasture Research Brief was prepared by Drs. Sarah Castle and Samantha Bosco from the UW-Madison Sustainable Landscapes and Livelihoods Lab, in the Department of Forest and Wildlife Ecology. For contact information and updates about ongoing WI Silvopasture research, please visit <https://castlelab.cals.wisc.edu>