



Cornell University
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SCNYAG
South Central New York Agriculture Team



Silvopasturing in the Northeast

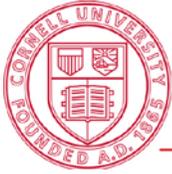
Definition

Silvopasturing is the combination of trees, forages and herbivores for a productive benefit. A silvopasture can range from a pastures enriched with trees to a properly thinned natural stand or plantation. A silvopasture is only as good as the *quality* and *quantity* of the food available. Consequently, neither a dense woods with a barren understory – nor a thicket of plants low in palatability will sustainably meet the nutritional needs of livestock.

Benefits

Not all woodlots are suitable for silvopasturing, but many farms have wooded acreage that can be developed into quality silvopastures to meet one or more landowner goals. Some benefits of silvopasturing include:

- Control of invasive and interfering plant species
- Diversified, medicinal diet for livestock
- Heat and cold stress amelioration
- Shelter from extreme weather
- Stimulate forest regeneration through understory vegetation control and soil scarification
- Provide short-term, annual income from wooded areas
- Increased total stocking capacity of farm
- Improve wildlife habitat
- Supplement forage curves
- Qualification for property tax abatement through increased income
- Possibly improve the quality and quantity of forages
- Increased grazing time in shade = higher Average Daily Gains (ADG)
- Improved nutrient recycling
- Multiple, diversified crops and income sources
- Soil protection
- Emergency forage
- Improved aesthetics
- Better rainfall interception



Requirements

- Reasonable access
- Ability to enclose area with a secure fence
- Availability of water
- Willingness to care for livestock
- Productive site

Modern Factors that Justify Expansion of Silvopasturing in the Northeast

- Demand for more localized food production and niche livestock products
- Increased land ownership costs
- New fencing methods and grazing systems
- Biomass markets permit commercial harvests of low-grade timber
- Interfering plant species

Qualities of an “ideal” food source in a silvopasture system

- Shade Tolerant (survives and grows in shade)
- Perennial
- Palatable and nutritious
- Retains quality over long season
- Cheap and easy to establish
- Persistent
- Low-input

Silvopasture Food Sources

- Forages: herbaceous plants, grasses, sedges
- Browse: edible portions of woody plants
- Mast: fruits, nuts, seed pods
- Other: fungi, invertebrates, small mammals, insects (in case of hogs and chickens)



Some Shade Tolerant Forages for NY (in approximate order of tolerance)

- Kura Clover
- Crimson Clover (considered an annual in New York)
- Reed Canary Grass
- Bluegrass
- Eastern Gama Grass
- Tall Fescue
- Orchard grass
- Others?

Source: US Forest Service Northern Research Station

Keys to Establish Food in the Silvopasture

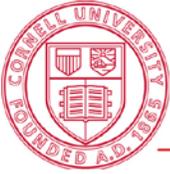
- Modify stand density to allow adequate sunlight to reach the ground in a “3-D” system
- Meet the germination requirements for target plant species
- Management of system to avoid negatively pressuring desirable plants

Methods to Establish Forages and Browse

- Open canopy to establish understory growth (< 60 ft² of basal area per acre – leave “best” trees)
- Broadcast seeding (plus “hoofing in” of seeds?)
- Winter yarding (haying) in wooded areas for organic matter and nutrient deposition
- Coppicing of hardwood timber
- Soil scarification (duff is barrier to seed germination)
- Liming and other chemical modifications

Thinning Woodlots and Plantations

- Commercial Harvest (stumpage sold for profit) - use a Consulting Forester, and don't “High Grade”!
- Pre-commercial thinning (timber culled at cost) – can be salvaged for products, or left to enrich soil and create habitat
 - Felling
 - Girdling
 - Poisoning



- Flaming
 - Mechanical
- Animals alone are usually not sufficient to accomplish the thinning (browsing, bark stripping, trampling)

Methods to Establish Trees

Planting

- Trees need to be protected from browsing and rodents with physical barriers
- Protection from herbaceous competition with herbicides or mulches
- Protection from defoliating insects?
- Water during droughts for first 1 – 2 years
- Select appropriate species (hardwoods are much more difficult to establish than softwoods)

Natural Regeneration

- Often requires professional assistance for success (Forester)
- Needs carefully-timed thinning, and eventually overstory removal. Must be done in a way that regeneration can escape livestock and deer (use of tree tubes or tree tops for shelter)
- Livestock may need to be removed for a few years from site following release of regeneration

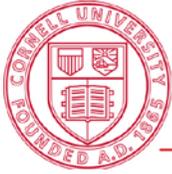
Things to Watch Out For

Poisoning - sensory feedback and mom will usually tell animals what to avoid, but watch out for special exceptions like:

- Wilted cherry (*Prunus* spp.)
- Hemlock and Yew
- Mountain Laurel
- Acorns?

Predators

- Well-electrified, secure fence is best protection
- Guard animals
- Bring animals in at night
- Birthing in May (when alternative prey is available)
- Mix small animals with large



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Additional Risks

- Deer Worm in small ruminants
- Hunting season
- Rabies
- Puncture wounds to feet
- Rapid colonization of interfering or non-palatable plants

Tips for Success

- Many fencing options, but high-tensile wire will resist falling debris the best. Don't fasten high-tensile wire to living trees!
- Longer rest areas where natural hardwood regeneration (vs. grasses and forbs) is the predominant food source (1-2 grazings per season)
- Rotate animals frequently and meet their "needs" to avoid damaging behavior
- Mixed livestock species usually work best in a Silvopasture system, but know the costs of adding a new species (better fencing, duplicated efforts, etc)
- *Start with a written plan that includes a budget to assess the feasibility of a project!*

Achieving Success

Both silviculture (the science of growing trees), and grazing are considered to be the "artful application of science". Consequently, combining these two systems would be considered a "fine art". Your ultimate success with silvopasturing will depend on your skill, knowledge and experience.

As with any new venture, there is a learning curve involved – so seek advice from others, experiment, and start small – but above all, start. There is also a cost to doing nothing, or doing nothing new.

The author, Brett Chedzoy, is a forester for the Cornell Cooperative Extension South Central New York Agriculture Team, and in his free time raises hair sheep, goats and black angus cattle on his family's farm near Watkins Glen, NY. Brett may be reached by email at: bjc226@cornell.edu

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