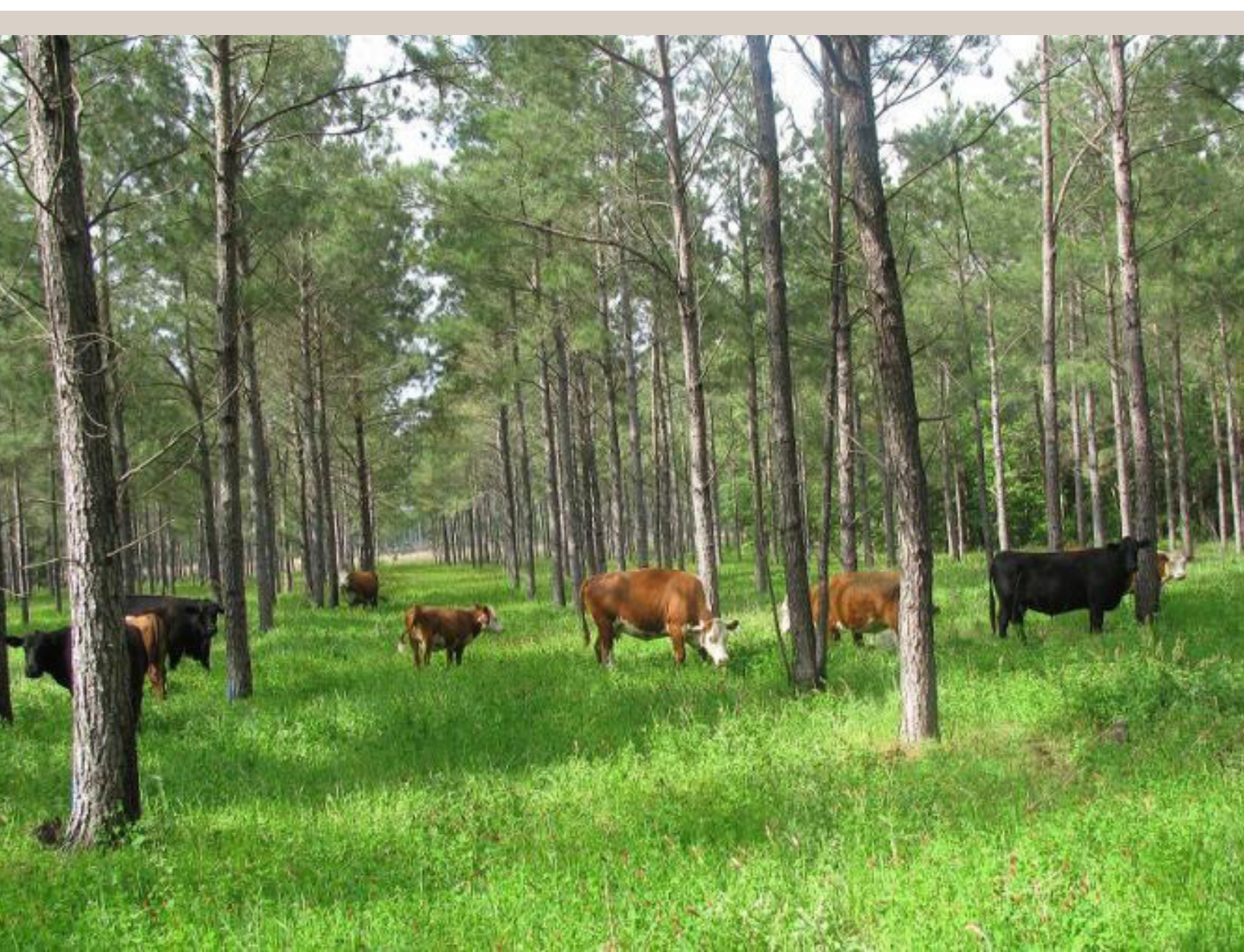


*"The best time to plant a tree is 20 years ago. The second best time is now!" African Proverb*

## Agriculture Resiliency

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# Silvopasture



**Snohomish Conservation District**

*working together for better ground since 1941*



## SILVOPASTURE

We are fortunate to live in the Maritime Pacific Northwest, surrounded by the Salish Sea. Our unique environment offers habitat to an abundance of marine and terrestrial flora and fauna that support our lifestyles and cultural heritage. However, balancing land use with protecting our natural resources can be challenging, especially when you own livestock. Fortunately there is a land use practice that provides benefits to your livestock, diversifies your production, all while protecting the unique ecology of our area.

### What is Silvopasture?

Silvopasture is the practice of grazing livestock under trees with the goal of integrating the management of three components: tree crops, livestock, and forage. Trees are selected for their crop value (such as fruit, timber and/or nut trees) or for additional forage benefits. By combining the three components of silvopasture, a synergistic system is created that allows for all components to be more productive together than they would otherwise be. This creates a system that both increases economic potential while protecting, and in many cases increasing, the ecological health of the land.

Adding trees into a grazing system creates synergies through the creation of microclimates, changes in soil nutrient profiles and soil structure, direct transfers of resources between plants, group defense against pests, and increased habitat for pollinators and other beneficial insects. Ultimately this creates a grazing system that is sustainable, requiring little to no off-farm inputs such as fertilizers or pesticides (Sharrow et al, 2009).



### Benefits

When properly implemented, silvopasture can provide many economic and environmental benefits. A livestock component added to timber or orchard trees creates a stable source of income as trees mature, or adds additional income to already mature trees. For those grazing livestock, adding timber trees, orchard trees, or forage trees provides more future income than grazing alone and more market flexibility. Silvopasture systems are often found to be more profitable and less risky than livestock or timber production alone (Sharrow et al, 2009).

By sharing the costs of livestock and timber/tree crop production on the same parcel of land, individual component production costs can also be reduced. In silvopasture, uses are linked, forming a web of positive benefits. For example, the addition of trees dramatically increases biodiversity of organisms in the soil and the leafy organic matter they provide can contribute significantly to soil fertility. Nitrogen-fixing trees and forage species can also substantially increase nitrogen inputs, further improving soil health. All of this combined with the addition of fertilization through animal manure reduces the need for off-farm sources of fertilizers. This not only saves farmers time and money, it also helps to

protect surface and groundwater from nutrient contamination.

There are a number of other ecological benefits of silvopasture. Deep-rooted trees and more productive forage grasses provide a “safety net” for water quality by creating a filter that takes up and utilizes nutrients from manure before they can leach into groundwater or run into surface waters. Trees provide habitat for beneficial insects, birds, and small mammals, and can be a part of essential wildlife corridors across the landscape, as well as an effective form of natural pest control.

Silvopasture is also showing considerable promise for its carbon sequestration potential. Studies have been done in the Pacific Northwest in cool-season Douglas fir silvopasture systems. One site in western Oregon was calculated to sequester 740 kg/ha/yr more carbon from the atmosphere than forest stands and 520 kg/ha/yr more carbon than pastures for the first 11 years of establishment (Sharrow and Ishmail, 2004). This carbon sequestration not only has a significant social benefit, it can also have a positive impact on how the farm is viewed by consumers. As people become more ecologically aware and concerned, farms with practices that are part of the solution to climate change can offer a social impact that consumers will value.

Below is a list of the most common benefits provided by silvopasture systems:

- Diversified timberland income by added livestock, hay, grazing/hunting proceeds
- Reduced need for chemical or mechanical vegetation control underneath the trees
- Reduced fire hazard in the absence of brush and accumulated fuels (as a result of managed grazing)
- Reduced need for nitrogen fertilization in grass/legume silvopastures
- Recycled nutrients from animal wastes benefit forage and tree growth
- Eliminated need for separate tree fertilization
- Delayed forage maturity in the fall and earlier green-up in the spring (longer season for forage species)
- Improved forage nutritional quality
- Increased livestock protection from summer heat and winter chill
- Increased livestock growth due to increased nutrition and decreased weather stress
- Improved cover and forage for wildlife
- Increased opportunities for recreation, e.g., hunting, wildlife watching

The benefits realized in a silvopasture system will depend on the design, level of management, management objectives, and external influences.

## Management

There are essentially three management phases in a silvopasture system:

- **Tree establishment/protection (typically years 1-5):** This phase includes normal pasture management with the addition of managing the establishment, protection, and growth of young trees. Special attention should be paid to controlling competing vegetation and protecting trees from livestock and wildlife. The trees themselves have little impact on forage or livestock at this phase.
- **Open-canopied forest (typically years 5-15):** In this phase the balance of competition and synergies between trees, forage, and livestock affects the production of each component. If management is done well, each component can be more productive. This is the phase where most silvopasture systems are kept. If systems move to a closed-canopied phase then insufficient light will reach the ground for forage and livestock.
- **Closed-canopied forest (years 15- maturity):** This phase ceases to be a silvopasture system and becomes a late rotation forest. Silvopasture avoids this phase by planting at lower densities, thinning trees, and/or pruning.

Once an open-canopied forest phase is achieved, management of the three components of the system becomes important in order to reduce competition and take advantage of built in synergies to increase the production of all of the components simultaneously.

**Trees:** Conifers can be good choices for silvopasture. They respond well to intensive management, have crowns that allow more light to penetrate the forest floor, and they are not as likely to be palatable to livestock. Small livestock can often do well with nut and fruit trees. For example, fruit orchards and sheep, or chestnuts and hogs. With good management, trees benefit in a silvopasture system showing faster growth in height and girth (Sharrow et al, 2009).

**Livestock:** In silvopasture systems, livestock are used as both a product and as a management tool to balance the competition between trees and forage. Livestock in silvopasture systems show less overall stress, they put on weight more readily, kid/calve better, and produce more milk than livestock grazing open pasture alone (Pent & Fike, 2014). Establishing grazing rotations so that animals move uniformly through tree stands, allowing forage time to rest and re-establish sufficient growth, and avoiding overgrazing and compaction create a highly productive system. Manure distribution can be kept more uniform by providing abundant shade and water for livestock. Keeping travel distance to water under 800 feet and providing plenty of trees for shade will help keep animals from concentrating in one area.

**Forage:** In the Pacific Northwest, cool-season forages work best for silvopasture production. Species include subterranean clover, white clover, perennial ryegrass, tall fescue, and orchardgrass. These plants can maintain good production in 50% sunlight conditions (Sharrow et al, 2009). Make sure that forage plants are kept back from young trees to minimize competition for resources. Forage in a silvopasture system can stay productive longer through the growing season and has shown better nutritional profile for ruminants than forage grown in open pasture (Pent & Fike, 2014).

## How to Begin?

Silvopasture can be established either by planting trees in an improved pasture, or by thinning a tree stand and planting improved forage. The principles of silvopasture are the same throughout the world, however, there are management requirements, benefits, and species that will thrive in different parts of the country. In the Northwest, trees such as Douglas fir, red alder, black walnut, chestnut, honey locust, maple, and poplar are some of the trees that do well in a silvopasture system for cattle. Forage species that do well in our area include orchardgrass, tall fescue, ryegrass, white clover, and subterranean clover (USDA, 2013). Smaller livestock such as sheep, pigs, and fowl can be integrated into orchards or with Christmas trees creating a silvopasture system in most tree crop systems.

Silvopasture offers a multifunctional land use in which production and protection can be achieved on the same parcel of land at the same time. If you are interested in learning more about silvopasture, or if you would like to find out if silvopasture would be appropriate for your property, please contact Carrie Brausieck, Natural Resource Planner with the Snohomish Conservation District at 425-377-7014 or [cbrausieck@snohomishcd.org](mailto:cbrausieck@snohomishcd.org).

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