

Landowner _____



WHAT IS SILVOPASTURE ESTABLISHMENT?

Establishing a combination of trees and compatible grasses on the same acreage.

PURPOSE

Silvopasture establishment is used to provide forage for livestock and the production of wood products, reducing soil erosion, improving water quality, enhancing wildlife habitat, increasing net carbon storage and reducing fire hazard.

HOW IT HELPS THE LAND

Overall, silvopasture systems provide cost-effective economic returns while creating a sustainable system with many environmental benefits. Well-managed silvopasture systems also offer a diversified marketing opportunity that can help stimulate rural economic development.

WHERE THE PRACTICE APPLIES

Silvopasture practices are designed to produce a high-value timber component, while providing short-term cash flow from the livestock component. The interactions among timber, forage, and livestock are intensively managed to simultaneously produce useful timber products, quality forages and profitable livestock operations.

Situations where silvopasture establishment applies include:

- Pasture where trees or shrubs can be added
- Forest where forages can be added
- Land on which neither the desired trees nor forages exist in sufficient quantity.

WHERE TO GET HELP

For assistance with this practice, contact your local Natural Resources Conservation Service or your local Conservation District office.

APPLYING THE PRACTICE

When making tree and forage crop selections, consider potential markets, soil types, climatic conditions, equipment needs, and species compatibility.

Species selection for trees

On marginally productive lands, pine trees are well-suited for silvopasture systems because they can adapt to diverse growing sites, respond rapidly to intensive management and may permit more light to reach the forest floor than hardwood trees.

Genetically improved loblolly pine seedlings are preferred for establishment of silvopasture systems.

While a number of hardwood species have been successfully incorporated into silvopasture systems with grazing animals, these species typically take a longer time to establish and reach maturity, thus increasing the rotation period between timber harvests.

Tree establishment

Tree establishment in existing grass fields can be difficult. Items to consider for tree establishment include:

- Site preparation – On sites that have been in pasture and are subject to compaction, ripping the soil surface down or adjacent to the planted tree rows before planting will improve growth and survival.
- Weed control – At a minimum, vegetation should be controlled in a three-foot diameter around each tree or row for 2 to 3 years.
- Number of trees – To maintain grass vigor plant between 100 and 400 trees per acre.
- Protection – Protect the trees from grazing during establishment utilizing protective measures such as fencing or by utilizing the field for hay until the trees are tall enough and strong enough to withstand grazing pressure.

Tree layout

Spacing distance between woody plants and row sets should be based on landowner objectives, tree and shrub environmental requirements, light requirements and growth periods of the forage, and machinery width needs.

Plant trees in single or double row sets with alleys 15' to 30' apart. Plant trees 8' or 10' apart within each row and the distance between rows should be 8' or 10'.

For existing forest plantations, reduce stocking levels to at least a 50% stocking level for the normal stand or adjust the canopy density to accommodate the needs of the forage species. Trees should be as uniformly spaced as possible for even shade distribution.

Species selection for grass/legumes

All forage species should be adapted to the site conditions, which may change throughout the property. Consider forage species that can tolerate the low soil pH that is common to pine production. When possible, choose native, non-invasive forage species.

Forage growing under the shady, low wind environment near trees tends to mature more slowly and, therefore, be lower in fiber and more digestible than that growing out in the open. The forage component should be a perennial crop that is:

- suitable for livestock grazing,
- compatible with the site (soil, temperature, precipitation, planted trees),
- productive under partial shade and moisture stress, and
- responsive to intensive grazing management.

Livestock

Livestock **MUST** be intensively managed in silvopasture systems. Timing and duration of grazing, stocking rates, and carrying capacity of the pasture must be carefully monitored to maintain site quality and tree seedling survival by minimizing damage to seedlings by browsing, trampling and rubbing, and preventing overgrazing and soil compaction.

Trees in pastures provide shelter for livestock during periods of inclement weather. This can significantly improve animal performance during particularly hot or cold times of the year. Trees provide evaporative cooling, reduce radiant heat loss at night, and reduce wind speed. These buffered environmental conditions allow animals to spare energy for growth, particularly under hot conditions. Increased gain, milk yield, and conception rates have been reported for cattle or sheep grazing pastures with trees in warm environments. The tree/timber component should be capable of providing the desired products and be:

- marketable,
- fast growing,
- native (if possible) and
- compatible with the site (soil, temperature, precipitation, planted forages).
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Some damage to trees from livestock is expected and proper prescribed grazing management will keep the damage to acceptable levels. Initial stocking considerations should allow for some losses due to livestock. Younger livestock are more prone to damage trees than older, more experienced animals. Livestock activity is more likely to impact hardwood trees than pine. Pine, although not really palatable to livestock, are most likely to be browsed after spring bud break while foliage is still light green in color.

Where livestock damage must be minimized, young silvopasture systems may be hayed. Once the top branches of trees grow above the reach of livestock and a thick layer of bark has developed, potential for tree damage by livestock is minimal and management practices become the same as those for pastures.

MAINTAINING THE PRACTICE

Young trees will benefit from vegetation control after planting. Herbaceous plants and many brush species may be effectively suppressed by prescription grazing, mechanical treatment or chemical application. A commonly used approach when planting trees into established pastures is to spray a strip or circle around trees to provide a four to six foot diameter competition-free zone around each tree.

Livestock grazing should be intensively managed. A successful silvopasture requires understanding forage growth characteristics and managing the timing and duration of grazing to avoid browsing of young tree seedlings or elongating shoots.

Livestock should be excluded from tree plantings during vulnerable periods. Similar approaches can minimize damage by trampling or rubbing. Improper management of silvopasture systems can reduce desirable woody and herbaceous plants by over-grazing and soil compaction. When introducing livestock to newly-established silvopasture systems: 1) have plenty of feed on hand; 2) provide water, minerals, and supplements away from new trees; and 3) be willing to accept some seedling damage. Thus, proper management is the key to success in a silvopasture system.

Available management tools include:

- tree harvesting, thinning or pruning
- fertilization to improve both forage and tree production
- planting legumes for nitrogen fixation and forage production
- multi-pasture, rotational grazing
- rotational burning
- supplemental feeding

- water source development (e.g., stock tanks, photovoltaic pumps, hydraulic rams, etc.)
- locating salt/mineral licks and walkways to encourage uniform livestock distribution
- fencing (e.g., standard or electric), tubing, plastic mesh, repellents, and seasonal livestock exclusion to reduce damage to young seedlings



Pine silvopasture system developed from an existing pasture.



Hardwood silvopasture system developed from an existing forest stand.

