United States Department of Agriculture

Silvopasture Information Sheet

Missouri Information Sheet IS-MO-381Silvopasture

Natural Resources Conservation Service (NRCS) Missouri Conservation Practice 381
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Silvopasture

Silvopasture is an agroforestry practice that *intentionally* combines trees (or shrubs), forage, and livestock into a single *integrated* system. Silvopasture *IS NOT* "woods grazing" or allowing livestock unmanaged access to wooded areas. Silvopasture *IS NOT* using livestock to "clean up" a wooded area or to control invasive species.

Conditions Where Practice Applies

- Pasture where trees or shrubs can be added;
- Tree plantations where forages can be added or enhanced;
- Land on which neither the desired trees nor forages exist in sufficient quantity to meet the land user's objectives.

Benefits

Compared to traditional pastures, silvopastures can provide a variety of added benefits.

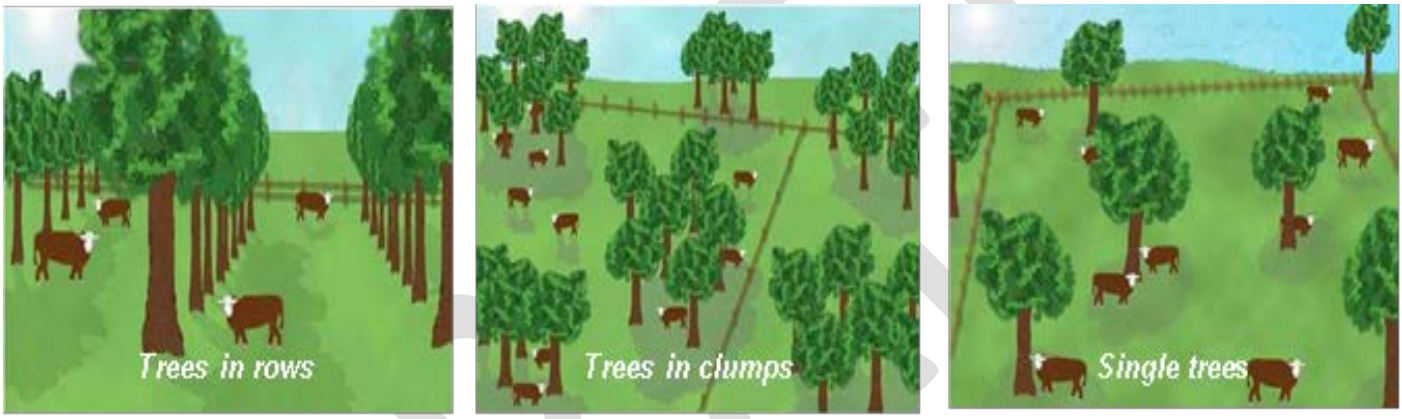
- Shade in the summer and shelter in the winter moderates temperatures, improving overall livestock health and productivity.
- Growth period for cool season forages is extended in shaded environment, providing more grazing opportunities in summer.
- Forage quality may be improved in shaded environment (less lignin content).
- Trees and shrubs provide additional on-farm products and opportunities to diversity farm income.
    - Nuts, fruits, and seeds
    - Solid wood products – logs, posts, firewood, and woody florals
    - Other products such as sap (syrup), oils, and medicinal extracts
- Soil health is improved through the addition of a perennial root system, leaf organic matter, and improved infiltration.
- Trees provide an early source of nectar for pollinators and provide shelter for other beneficial insects.
- Air quality is improved through added CO2 uptake and carbon sequestration.
- Water quality is improved through improved infiltration.
- Additional habitat is provided for wildlife.
- Visual appearance tends to be park-like and appealing.

Planning Considerations

Silvopastures are complex agricultural systems that will change and evolve over time, requiring the manager to adapt to changing circumstances. Due to the countless possible combinations of soil types, livestock, tree and shrub species, and forages, there is no one-size fits all design. However, there are several basic items that should be considered for all silvopastures.

1. Soil types – Are they suited to the planned trees and forages?

2. Tree/shrub species – Are they adapted to the site? Is there a market for the end product? How much shade is produced?
3. Tree/shrub spacing – Trees are typically planted in rows to produce evenly distributed shade, but may also be planted as single trees or in variable clusters (see diagram below).
4. Forage type – Select forages that meet livestock needs while also being suited to growth at some level of shade. In general, cool season grasses and legumes are better suited than warm season plants. Consult with an agronomist or other specialist for additional information.
5. Livestock type – Different livestock types will have more or less impact on trees. For example, cattle prefer grass while goats enjoy browsing woody plants.
6. Grazing management – Timing and intensity of grazing should be planned to minimize negative impacts on trees and shrubs.
7. Time – As trees grow, the growing environment will change, necessitating changes in management. This may include thinning and pruning trees, changing forages species, or changing livestock type.
8. Maintenance needs – What additional tools or equipment is needed?



Tree/Shrub Establishment and Management
For successful growth and development, trees should be protected from damage and managed with the end goal in mind. The following outlines activities that are generally necessary.

- *Establishment/Protection Phase (typically years 1-5)*
  - Control competing vegetation (including forages) around trees using mulches, tree mats, or herbicides. An area 3-4 feet wide for each tree is sufficient for newly planted trees.
  - Manage grazing timing, forage availability, and livestock type to limit tree damage.
  - Use physical barriers such as tree shelters or temporary electric fencing to discourage browsing.
  - Consider excluding livestock during establishment and remove the forage as hay instead.
  - Replace trees as necessary to maintain proper spacing and stocking.

- *Early Growth Phase (typically years 5-15)*
  - Continue protective measures as described above as needed.
  - Prune trees to achieve desired form (*see also Tree & Shrub Pruning, IS-MO660*)
    - Prune for strength and structure (eliminate narrow branch angles)
    - Prune to encourage tree crop or wood products (pruning for fruit production requires different techniques than pruning for timber production).
    - Prune low branches to attain desired level of shade and to allow for ease of access.
  - Thin trees as needed to maintain desired stocking and shade levels.

- *Years 15- Maturity*
  - Thin trees as needed to maintain desired stocking and shade levels. A good target is 40-60% shading.
  - Forage species may need to be changed as shade levels increase.
  - Prune trees as needed.

Other Sources for Silvopasture and Agroforestry Information

- USDA National Agroforestry Center: https://nac.unl.edu/
- University of Missouri Center for Agroforestry: http://www.centerforagroforestry.org/
- Association for Temperate Agroforestry: http://www.aftaweb.org/