



Cattle and pine trees are a common silvopastoral system; however there are numerous other options available. Photo courtesy: National Agroforestry Center

Non-Timber Forest Products

Agroforestry Part Two: Silvopasture

By Deborah B. Hill

The second of the five agroforestry systems that might be practical to implement in Kentucky is silvopasture. In this practice, you have three simultaneous crops: the tree crop, the forage crop, and the livestock crop. As with other agroforestry practices, if you plan to use biocides (pesticides, fungicides, insecticides) and/or chemical fertilizers, you must be sure that all of the component parts of the proposed system can tolerate the additives. Foresters have a long-standing attitude that cattle and trees do not mix (because of soil compaction and rubbing around and on the trees by the livestock), but in this case, you are intentionally putting them together, ideally for mutual benefit.

Cattle and pine trees are perhaps the most common combination in a silvopastoral system, but such a system can be any combination of something from the animal kingdom plus one long-term (tree) plant component and one annual (forage) plant component. Successful combinations could include sheep or goats on grass in fruit orchards or Christmas tree plantations, “weeder” geese in pecan orchards, and even honeybees in a fruit tree orchard with a

clover or alfalfa ground cover.

Classically, silvopasture systems are set up with single or double rows of trees between which are wide alleys of the forage crop for livestock grazing. In the first year or two of establishment of the tree crop while the tree seedlings are still very vulnerable, the landowner could mow the

forage grasses

and use that as fodder for livestock rather than allowing the animals into the area. In Kentucky, many

cattle farmers have implemented rotational grazing for their livestock which has proven to be beneficial to both the forage crop and the animals. So one possibility of implementing silvopasture on cattle-raising farms is to plant the tree crop along the fence lines that separate the different paddocks for the grazing animals. A single or double line of electric fence on the exposed side of the

Silvopasture is the second in a five-part series of Agroforestry articles. Agroforestry also includes the following practices: alley cropping, riparian buffer strips, windbreaks, and forest farming. See Kentucky Woodlands Magazine Vol. 1 Issue 2 for more information.



Honeybees, reared in a fruit orchard, are an example of silvopasture. Photo courtesy: David Cappaert, Michigan State University, Bugwood.org

seedlings ought to keep the animals from either grazing on or stepping on the small tree seedlings. In time, the tree component would be tall enough to provide shade for the animals, and, depending on what tree crop you have selected, provide short-term crops such as fruits or nuts (or seven-year-old Christmas trees), while allowing the trees to contribute their environmental services such as soil erosion control and diversity. Another option for the trees is to scatter clumps of trees throughout the pastureland. While the tree component provides shade and diversity on the site, the presence of the livestock contributes to the fertility of the forage crop.

Some considerations when selecting the tree component include:

- What do you want to market (fruit, nuts, Christmas trees/greens, timber, fence posts)?
- Do markets already exist in your area for those products, or will you have to create them?
- Is the proposed tree species deep-rooted so that the tree roots will be less likely to compete for moisture and nutrients with the forage crop?
- Does the tree component yield a high-value product in the short term, the long term, or both?
- Is the tree species appropriate for your soil conditions, moisture availability, and topography?
- Does the proposed tree species cast a heavy or light shade (heavy is better for shading the livestock; light is better for the health of the forage crop)?



*Sheep and trees are another example of silvopasture.
Photo courtesy: Linda Hardesty*

To maximize success with this system, remember that the trees will need some special care during their establishment period:

- vegetation control immediately around the seedlings,
- shaping of Christmas trees to maximize their salability,
- insect and disease monitoring for both forage and tree crops, pruning of lower branches of trees grown for timber, and
- accessibility for tree crops if you have fruit or nut crops to gather during the lifetime of the tree crop.

For the forage crop, you want to consider:

- Is the forage crop suitable for livestock grazing?
- Is the particular forage crop suited to the soil, moisture and nutrient conditions of the soil?
- Can this forage tolerate some shade?
- Can it tolerate heavy grazing?

For more information about Agroforestry and Non-Timber Forest Products, contact Deborah Hill at 859.257.7610 or visit www.ukforestry.org, www.unl.edu/nac, or www.centerforagroforestry.org

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