

# Forages for Silvopastures

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Silvopasture is not new to the world, but it is new to Michigan. As a state with a lot of forest, silvopasture in Michigan offers a great opportunity for the merging of forestry and livestock production. As with any new practice, livestock producers have a lot of questions. Two common questions are: 1) which forages will work in this system? and 2) what about toxic plants in the woods? These are very good questions.

## Forage Species

We don't have much data to verify suitability of forage species in our specific environments and have to rely on data from other states. New York state environments are reasonably similar to what we might expect in Michigan so recommendations from the Cornell silvopasture group are a good place to start.

Forage species used in silvopasture need to be tolerant of shading and able to compete with the trees for nutrients and water. Because many woods may have acid soils, it is helpful if the forages can tolerate some acidity. The forage should be easy to establish using minimum tillage or broadcast methods. Good starting points for species selection are listed below. Other species may also work, but we just don't know details at this time.

*Orchardgrass.* As the name suggests, this grass is tolerant of shade and works well under trees. It is easy to grow and adapted throughout Michigan where it is already widely used for hay and pasture. Tread-in planting has been successful in WV. This is where seed is broadcast, and animals are then used to trample the seed into the soil.

*Tall fescue.* Tall fescue is already present throughout Michigan, tolerant of pH and fertility limitations, and worked well in Appalachian silvopastures, but the Appalachian work used endophyte infected fescue. Most fescue planted in MI is endophyte free in order to avoid problems

associated with endophyte toxicity to livestock. Because the endophyte helps with environmental stress tolerance, it is not clear whether endophyte-free varieties would work in silvopasture. Tall fescue may winterkill in severe Michigan winters without good snow cover. Tread-in establishment can work.

*Red Clover.* This is the most shade-tolerant clover and is well-adapted throughout Michigan, but it is a short-lived species that must be replanted every 2 to 3 years. It is easy to establish by broadcasting.

*White clover.* This has reasonable shade tolerance and is a long-lived clover that can spread. It is easy to establish by broadcasting.

## Toxic Plants

Management of toxic plants in silvopasture is no different than management of toxic plants in regular pastures. Basic precautions include knowing exactly what species are present and the specific conditions under which they may become toxic, so that preventative actions can be taken. In general, livestock can often tolerate a few bites of a poisonous plant in an otherwise balanced diet, especially if the rumen has been introduced gradually to the diet so it can adapt. Because they are not ruminants, horses tend to be more susceptible to toxic plant ingestion than cattle, sheep, or goats. Hungry animals are more likely to eat something they should not than animals with plenty of choice in front of them, so good pasture stocking rates and rotation practices are still important in silvopastures. A few of the most common possible problems are outlined below. Others can be found in the resource list. There are relatively few zero-tolerance poisonous plants in Michigan where eating a small amount will lead to death.

*Poison Hemlock, Water Hemlock.* These two related species are in the zero-tolerance group of

toxic plants because a single ingestion of small amounts can cause death. They can be found throughout Michigan in moist forest edges.

*Cherry trees/shrubs.* All species of cherry trees (black cherry, chokecherry, etc) contain prussic acid that can be acutely toxic. Livestock can adapt to eating small amounts of prussic acid. Cherry poisoning is most often reported when windstorms blow down cherry branches and livestock binge on wilted leaves.

*Red Maple, Box Elder Maple.* These trees are found throughout Michigan. This poisoning is specific to horses only and occurs when leaves (red maple) or seeds (box elder) are consumed.

*Bracken Fern.* This plant is common on forest edges throughout Michigan. It causes toxicity by interfering with thiamin metabolism. Poisoning requires ingestion of large amounts of fern over long periods, weeks to months. Bracken is not palatable, so good grazing management should prevent problems.

*Acorns.* Most acorns are toxic to cattle due to the presence of hydrolizable tannins. Cattle are most likely to eat them when green acorns are freshly dropped from the oak trees. Problems are easily avoided by keeping cattle away from oak trees until dropped acorns have weathered and become unpalatable.

## Resources

Cassida, K., and J. Lindquist. 2018. *Frost-Seeding – an Effective Forage Establishment Practice for Michigan*. MSUE #E2125. <https://forage.msu.edu/wp-content/uploads/2018/08/E2185-FrostSeedingAnEffectiveForageEstablishmentPracticeForMichigan-2018.pdf>

Marczewski, A.E. 1983. Poisonous Plants Toxic to Livestock in Michigan. MSU Extension E-1725, MSU. East Lansing, MI.

Metzger, M. 2012. Plants poisonous to livestock. MSUE Ag News, [https://www.canr.msu.edu/news/plants\\_poisonous\\_to\\_livestock](https://www.canr.msu.edu/news/plants_poisonous_to_livestock)

Michigan Forage Connection Website <https://forage.msu.edu/> Watch this website for several relevant new bulletins that will be coming out in 2019.

- Cassida, K., P. Kaatz, and J. Lindquist. *Recommended Forage and Pasture Crops for Michigan*.
- Cassida, K., R. Ehrhardt, and J. Lindquist. *Low-Cost Renovation Practices for Perennial Pastures and Hayland in Michigan*. Many of the renovation concepts described in this bulletin are appropriate for silvopasture

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