

# Tree Selection Guide for Mid-Atlantic Silvopastures

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*Chinese Proverb: The best time to plant a tree was 20 years ago. The second-best time is now.*



Photos by John Fike and John Munsell.

## About This Guide

This guide provides key information for selecting trees suitable for silvopasture operations in the Mid-Atlantic region of the U.S. – states include Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, and West Virginia. This guide includes species native to North America with an emphasis on those native to Mid-Atlantic states. Only woody plants over 25 feet tall at maturity that are primarily single stemmed were considered. Both deciduous and evergreens are included.

Trees are organized in alphabetical order by scientific name – evergreen species are listed first, followed by deciduous species. Key information is provided for each species including:

- site preferences,
- tolerance to site extremes,
- physical characteristics, and
- utility and maintenance issues.

Special considerations and cultivars of specific interest for silvopasture applications are also described.

Over 180 woody plant species were considered for this guide. The 20 species included were selected based on site conditions, physical characteristics most suitable for silvopasture systems (root structure, crown size and density, phenology, etc.), growth rate, timber and non-timber product value, and availability in the marketplace. In addition, this guide focuses on species that are less susceptible to extreme weather events like drought or wind/ice when possible. Cultivars that offer superior disease resistance, growth form, and/or product characteristics most suitable for use in a silvopasture operation are listed.

Selecting the best tree species for your silvopasture can be an overwhelming task. With a host of species to choose from and many variables to consider, it can be hard to know where to start. This publication attempts to give you a starting point.

*NOTE: Some species not included may be the best choice for your silvopasture. Please use this guide as a reference only.*

Choosing the best trees for your silvopasture operation involves three steps:

- Assessing your site and identifying suitable species.
- Identifying species that meet your goals.
- Considering plant availability and sources.



Black Walnut is a popular silvopasture tree because of its open canopy, deep taproot, rapid growth rate, nut production, and valuable timber. Photo by John Fike.

## STEP 1: Assessing your Site and Identifying Suitable Species

Getting to know your site and selecting the trees that prefer those conditions is critical to the success of your silvopasture (tables 1 and 2). Trees planted in their preferred environment are more resilient, longer lived, and faster growing.

Familiarize yourself with each field in which you intend to plant. Different fields on the same farm can have dramatically different microclimates depending on the soil type, moisture availability, wind exposure, etc.

Matching plants to site conditions not only increases the chance that your trees will thrive, it also decreases your chance of financial loss. Tree planting projects can be costly, and the most expensive venture is the one that fails.

### Important factors to consider:

## Site Preferences

*Hardiness Zones* – The USDA Plant Hardiness Map divides the country into 11 zones based on the average minimum winter temperature - zone 1 is the coldest and zone 11 is the hottest. The average minimum varies about 10°F between zones. The zones of the Mid-Atlantic range from 5-8. Find your location on the hardiness map, and choose the right tree species for your climate.

*Soil pH* – Soil pH is a measure of the acidity or alkalinity of your soil. It affects the availability of important nutrients. Acidic soils have a pH range of 4.0-7.0. The pH of alkaline soils is 7.0 or higher. Test your soil and find tree species suited to its pH range.

*Soil Moisture* – The amount of water regularly available in a soil can dramatically affect the growth and long-term survival of most plant species. Four moisture designations are included in this guide – wet (W), Moist (M), Dry (D), and well-drained (X). Determine the moisture level of your soil by observing the soil in the spring and fall, as well as during and after rainfall.

### Test Your Soil!

Soil testing is an important part of the tree selection process. It provides information about the type of soil you have, as well as its nutrient levels and pH. Be sure to obtain separate tests for each unique section of your field. For example, if a field spans a bottom area near a stream, a sloped area, and a hilltop section, prepare a separate soil test for each location. Local extension offices can assist you or provide soil testing kits for a small fee. Detailed instructions are provided with each kit. Results are usually available within a few weeks.

## Tolerance to Site Extremes

Familiarity with extreme conditions possible on your site is critical. Many regions experience regular drought or are prone to periodic flooding. Some sites are exposed to heavy winds and winter ice storms. Be sure to select trees that can withstand these conditions if they are a threat in the fields you plan to plant.

Three tolerance categories are included in this guide – drought, flood, and wind/ice. Species are designated as tolerant (T), moderately tolerant (M), or not tolerant (T) for each category.

## STEP 2: Identifying Trees that Meet your Goals

Once you have narrowed down the list of species that will survive and thrive on your site, it is time to determine which trees will best serve the needs of your silvopasture operation. Some questions include:

- What secondary products are you most interested in – timber, fruits, firewood, etc.?
- Do you need a species that fixes nitrogen or assists with erosion control?
- Are you concerned about providing forage for bees?
- Would you like your silvopasture to provide fodder for your animals?

The best choices will be the trees that thrive on your site while meeting your short- and long-term goals and objectives.

## STEP 3: Considering Plant Availability and Sources

Finding a source for the species you want may seem like the last step of the tree selection process, but plant availability can often dictate which species you are able to plant. Time of year you want to plant, where you live, and the quantities and sizes of trees you wish to purchase can all affect which species are available to you. So where to start?

One of the best sources of plant material is your state's forestry agency. State nurseries often offer a large selection of hardwood and evergreen seedlings to landowners each spring. Many states post their availability and pricing online along with information about each species, planting tips, and other useful information. Department of Forestry trees are typically sold as bare root seedlings, requiring only minimal cold storage until planting.

But what if you want to plant a specific cultivar or larger plant material not offered by your state nursery? Wholesale tree nurseries throughout the mid-Atlantic region offer a wide-selection of cultivars and species in a range of sizes (from 1-year-old seedlings to 5-year-old saplings.) Larger nurseries sell in bundles of 10-100 plants – the larger the bundle, the lower the per-plant price. Smaller nurseries offer many hard-to-find cultivars. Large and small nurseries can typically ship plant material to any location with great success.

There are several ways to identify wholesale nurseries selling the species and/or cultivars you are looking for:

- **Contact your local extension agent!** These individuals often know growers personally or maintain lists of potential sources you can contact.
- **Contact your state or regional nursery and landscape association** for a list of reputable wholesale suppliers! The name of these associations is typically the name of your state followed by “nursery and landscape association” (e.g. Virginia Nursery and Landscape Association). NOTE: Tennessee is home to some of the largest and most affordable wholesale nurseries supplying trees to the mid-Atlantic. Visit the Middle Tennessee Nursery Association website for a list of some of these companies.
- **Do an online search** for the cultivar you are interested in! Many small nurseries maintain websites with extensive information about the plant varieties they grow. Email these growers, ask questions about what they offer, explain to them how you plan to use the trees, and develop a relationship. Growers are often your best source of information. They may suggest other cultivars you haven't considered.
- **Visit websites for associations and/or research programs** focusing on the tree crops you are interested in! Examples include the Northern Nut Growers Association and the North American Maple Syrup Council.

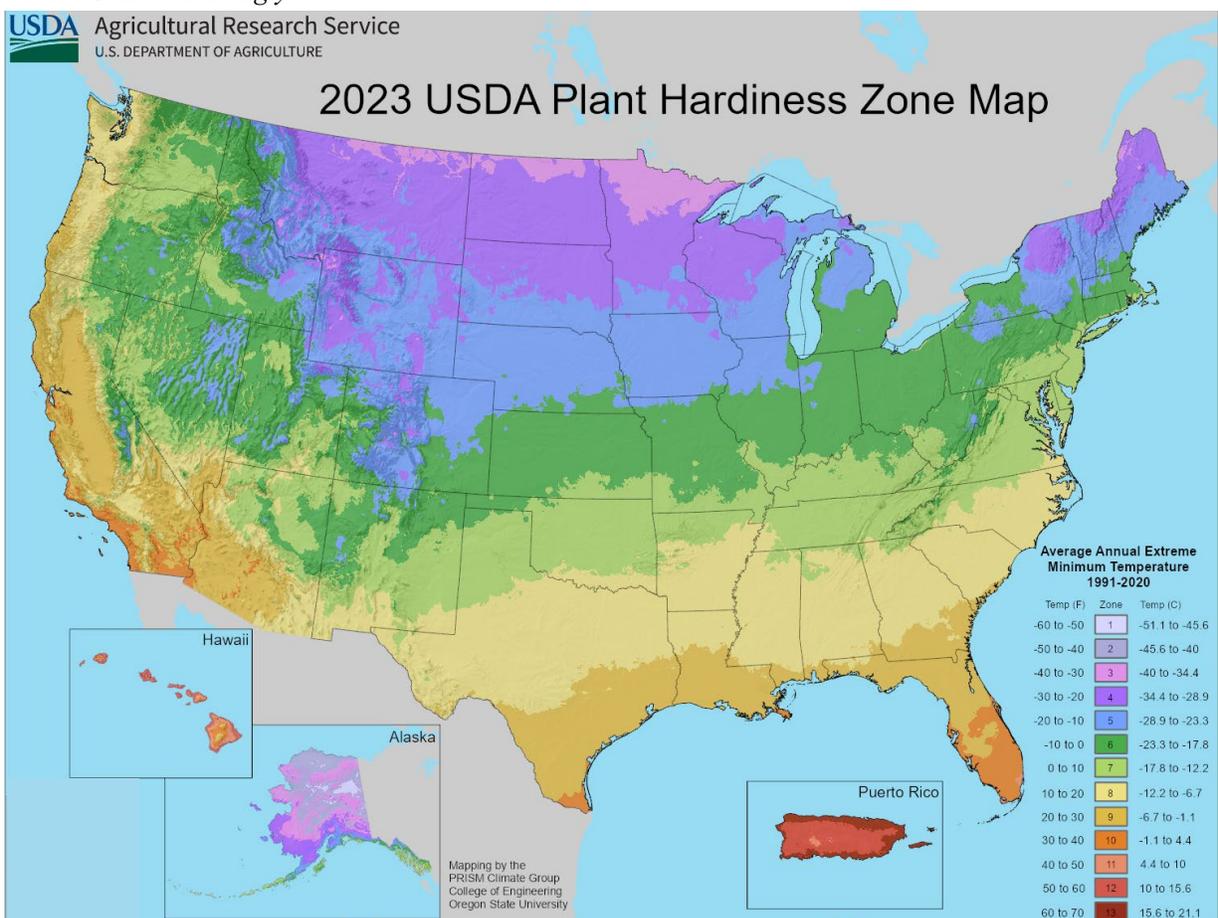
**No matter who you purchase from, time of year is critical for availability!** Spring is when the largest variety of plant material is available. Forestry offices and wholesale nurseries often run out of or quit selling trees by mid to late spring. It is best to look for a supplier early and to place your order in January-April. Fall planting is an option, but you may have fewer suppliers to choose from.

*NOTE: If you are working within a cost share grant, you may have purchasing guidelines and/or suggested suppliers. Be sure to consult your grant administrator.*

## Know Your Zone

Find your location on the USDA Plant Hardiness Map. Be sure the species you select will survive in your zone.

*Note: As our climate changes, the USDA plant hardiness zones may shift. This is particularly important when dealing with tree crops as their life span/rotation can span two, three, or even four decades. Your zone may change while your trees mature. Plan accordingly.*



**Drought Tolerance** – Drought tolerant trees can generally withstand several weeks between deep waterings without injury. NOTE: Windy locations can increase the chance for drought conditions.

**Flood Tolerance** – Tolerance to flooding conditions relates to the length of time a tree species can withstand standing water or a high water-table without exhibiting injury or decline

**Wind/Ice Tolerance** – Some tree species are less tolerant to high winds than others, meaning they are more likely to blow over or have limb breakage during hurricanes or other extreme wind conditions. This guide indicates tolerance levels for wind and ice separately but in the same column.

*NOTE: Black walnut and butternut produce the allelopathic chemical ‘juglone’ which can harm plants growing near them. Check with your local forester or extension agent before interplanting trees with black walnut, butternut, or other juglone-emitting species.*

### Suggested Trees for Drought

- Pitchlob
- Thornless Honey Locust
- Bur Oak
- Shumard Oak
- Black Locust



**Cultivars**

Cultivars that exhibit disease resistance, heat or drought tolerance, narrow/favorable crown shape, and superior fruit/nut quality are listed at the end of this guide.

Superior fruiting varieties/cultivars of Pawpaw such as Susquehanna or Wabash produce larger, sweeter, and more marketable fruits. Photo courtesy of Missouri.extension.edu.

### Physical Characteristics

Once you match tree species with the conditions of your site, you must consider the physiological **suitability** and overall **productivity** of each species in a silvopasture system (table 3).

**Suitability** relates to how much a given tree species competes – above ground and below ground – with surrounding forages for light, water, and available nutrients. Some tree species have physical characteristics such as deep rooting habit, late leaf out and early leaf drop, and a narrow or open crown that allow for optimal forage growth. Other species may generate heavy shade or have shallow, wide-spreading roots that reduce forage growth. This guide

includes trees with both a light and moderate impact on forage growth. *NOTE: Planting tree species with higher impact on forage growth may require wider spacing of trees and/or fewer animals per acre.*

**Productivity** relates to how fast a given species grows and how large it will become. For each physical characteristic, tree species are given a score of 1, 2, or 3 – with 1 indicating high suitability/productivity and 3 being low suitability/productivity.

### Utility, Maintenance, and Special Considerations

A key benefit of silvopasture systems is diversifying your revenue stream. All of the tree species listed here have potential value as timber products, non-timber products (fruit, nuts, etc.), or fodder. However, they may also have a cost associated in the form of pest/disease issues or maintenance requirements such as pruning. This guide provides utility and maintenance information (table 4), non-market benefits (e.g. bee forage and erosion control; table 5), and special considerations (table 6) for each species listed. Be sure to weigh these costs and benefits carefully when selecting your trees.

*Markets – Species with value in the following markets are marked with the corresponding symbols.*

T – Timber products: high value items such as veneer, flooring, and cabinets and lower value products like plywood, pulpwood, and lumber.

NT – Non-timber forest products: edible products (e.g. fruits and nuts), decorative products (e.g. barks and branches for garlands), and medicinal products.

FW – Firewood: species with a high heat value (BTU rating) and long burn time.

P – Posts: species with very dense and/or rot resistant wood qualities that can be sold for fence posts.

*Fodder Products* – The fruits, nuts, and/or leaves of some tree species may be used as food for livestock or other animals on the farm to reduce feed costs and increase nutritional variety for animals. The leaves of some species such as black locust, have a high nutritive value; other species, like red mulberry, produce leaves with a high digestibility.

Tree fruits and nuts can be used to “finish” animals, potentially adding market value to the meat (e.g. “acorn-finished pork”).

*Pest/Disease Issues* – Some trees are more susceptible to disease and insect pressure than others. Trees are ranked according to the number of problems, likelihood of attack, and severity of potential damage. Species commonly severely affected such as all ash species (pest = emerald ash borer) and chestnut (disease = chestnut blight) are not included in this guide.

## Other Benefits

W – Wildlife: tree species that support or benefit greater than 25 different types of animals.

B – Bee Forage: tree species that provide food for bee populations

FC – Fall Color: species known to have vibrant shade of yellow, red, orange, or crimson during autumn months.

EC – Erosion Control: trees with soil-stabilizing root systems that can withstand short-term, modest levels of moving water on sloping land.

WB – Windbreak: tree species that have steadfast rooting systems and branching that can withstand moderate to strong winds without breaking.

NF – Nitrogen-fixation: the ability of a plant to convert atmospheric nitrogen to a form useable by plant roots.



Photo by Bret Chedzoy.

### Suggested Trees for Fence Post Production

Thornless Honey Locust

Black Locust

Bald Cypress

## Selected Resources

Manual of Woody Landscape Plants – Their Identification, Ornamental Characteristics, Culture, Propagation and Uses. Sixth Ed. 2009. Michael A. Dirr. Stipes Publishing, Champaign, Illinois

Native Trees, Shrubs, and Vines for Urban and Rural America – A Planting Design Manual for Environmental Designers. 1988. Gary L. Hightshoe. John Wiley & Sons, Inc. New York.

Native Trees for North American Landscapes – From the Atlantic to the Rockies. 2004. Guy Sternberg with Jim Wilson. Timber Press, Portland, OR.

Virginia Tech Dendrology Factsheets: <http://dendro.cnre.vt.edu/dendrology/factsheets.cfm>

USDAFS Silvics of North America: [https://www.na.fs.fed.us/spfo/pubs/silvics\\_manual/table\\_of\\_contents.htm](https://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm)

USDA Plant Database, Factsheets, and Plant Guides: <https://plants.usda.gov/java/>

University of Florida, IFAS Extension, Environmental Database Information Source (EDIS): <http://edis.ifas.ufl.edu/>

Natural Resources Conservation Service Plant Materials Program: <https://www.nrcs.usda.gov/wps/portal/nrcs/pmreleases/plantmaterials/pmc/northeast/mipmc/cp/>

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# Tree Selection Guide for Mid-Atlantic Silvopastures - Our first 20 trees

Table 1a. Evergreen Site Preferences

Common Name	Scientific Name	Cultivars	Hardiness Zone	Soil pH	Soil Moisture
Shortleaf Pine	<i>Pinus echinata</i>		6-9	4.0-6.0	D-M, X
PitchLob	<i>Pinus rigida x taeda</i>		4-7	Acidic	D-M, X
Eastern White	<i>Pinus strobus</i>	Fastigiata (narrow/columnar when young)	3-7	4.5-6.5	D-M
Loblolly Pine	<i>Pinus taeda</i>		6-9	Acidic	M

D-dry, M-moist, X-well-drained

Table 1b. Deciduous Site Preferences

Common Name	Scientific Name	Cultivars	Hardiness Zone	Soil pH	Soil Moisture
Sugar Maple	<i>Acer saccharum</i>	Caddo, Commemoration, Legacy (heat and drought resistant); Temples Upright (narrow crown)	4-8	3.7-7.3	M-X
Pawpaw	<i>Asimina triloba</i>	Many	5-8	4.7-7.2	M-X
Hardy Pecan	<i>Carya illinoensis</i>	Many	5-9	6.5-7.5	M-X
Persimmon	<i>Diospyros virginiana</i>	Hicks, Meader, Pieper, Rnkwitz, Early Golden, John Rick, Killen, Miller, and Woolbright	4-9	4.7-7.5	D-M
Thornless Honey Locust	<i>Gleditsia triacanthos var. inermis</i>	Millwood, Calhoun, Hershey (seed pods w/ high sugar content)	4-9	5-8	D-M
Butternut	<i>Juglans cinerea</i>	Kenworthy, Mitchell	3-7	6.0-7.0	D-M, X
Black Walnut	<i>Juglan nigra</i>	Many	4-9	4.6-8.2	M, X
Yellow Poplar	<i>Liriodendron tulipifera</i>		4-9	4.5-6.5	M-X
Red Mulberry	<i>Morus rubra</i>	Johnson, Weisman, Cooke, Wellington	5-9	5.0-7.0	M
White Oak	<i>Quercus alba</i>		3-9	4.5-6.8	D-M, X
Bur Oak	<i>Quercus macrocarpa</i>	Urban Pinnacle (narrow/pyramidal)	3-8	4.6-7.5	D-M
Cherrybark Oak	<i>Quercus pagoda</i>		6-9	4.5-6.0	M, X
Northern Red Oak	<i>Quercus rubra</i>		3-7	4.3-7.3	D-M, X
Shumard Oak	<i>Quercus shumardii</i>		5-9	5-7.6	D-M, X
Black Locust	<i>Robinia pseudoacacia</i>	Appalachia, Allegheny, Algonquin	4-8	5.1-7.7	D-M
Baldcypress	<i>Taxodium distichum</i>	Shawnee Brave (pyramidal), Fastigiata (narrow/upright)	4-11	4.5-6.5	D-M

D-dry, M-moist, X-well-drained

Table 2a: Evergreen Tolerances

Common Name	Scientific Name	Cultivars	Drought	Flood	Wind/Ice
Shortleaf Pine	<i>Pinus echinata</i>		M	N	T-Wind, N-Ice
PitchLob	<i>Pinus rigida x taeda</i>		T		
Eastern White	<i>Pinus strobus</i>	Fastigiata (narrow/columnar when young)	N	N	N
Loblolly Pine	<i>Pinus taeda</i>		M	N	N

T-tolerant; M-moderately-tolerant, N-not-tolerant

Table 2b: Deciduous Tolerances

Common Name	Scientific Name	Cultivars	Drought	Flood	Wind/Ice
Sugar Maple	<i>Acer saccharum</i>	Caddo, Commemoration, Legacy (heat and drought resistant); Temples Upright (narrow crown)	N	N	T
Pawpaw	<i>Asimina triloba</i>	Many	N	N	N
Hardy Pecan	<i>Carya illinoensis</i>	Many	M	M	T
Persimmon	<i>Diospyros virginiana</i>	Hicks, Meader, Pieper, Rnkwitz, Early Golden, John Rick, Killen, Miller, and Woolbright	M	M	T
Thornless Honey Locust	<i>Gleditsia triacanthos var. inermis</i>	Millwood, Calhoun, Hershey (seed pods w/ high sugar content)	T	T	T-Wind, M-Ice
Butternut	<i>Juglans cinerea</i>	Kenworthy, Mitchell	M	M	N
Black Walnut	<i>Juglan nigra</i>	Many	M	M	T
Yellow Poplar	<i>Liriodendron tulipifera</i>		N	N	N
Red Mulberry	<i>Morus rubra</i>	Johnson, Weisman, Cooke, Wellington	M	M	N
White Oak	<i>Quercus alba</i>		M	N	Y
Bur Oak	<i>Quercus macrocarpa</i>	Urban Pinnacle (narrow/pyramidal)	T	M	T
Cherrybark Oak	<i>Quercus pagoda</i>		N	N	N-Wind, T-Ice
Northern Red Oak	<i>Quercus rubra</i>		M	N	T-Wind, N-Ice
Shumard Oak	<i>Quercus shumardii</i>		T	M	T
Black Locust	<i>Robinia pseudoacacia</i>	Appalachia, Allegheny, Algonquin	T	N	N
Baldcypress	<i>Taxodium distichum</i>	Shawnee Brave (pyramidal), Fastigiata (narrow/upright)	N	T	T

Tolerances: T-tolerant; M-moderately-tolerant, N-not-tolerant

Table 3a. Evergreen Physical Characteristics

Common Name	Scientific Name	Cultivars	Root Structure	Crown Phenology	Crown Width	Crown Density	Growth Rate	Mature Height (ft)
Shortleaf Pine	<i>Pinus echinata</i>		1		2	1	1	60-100
PitchLob	<i>Pinus rigida x taeda</i>		3		2	1.5	1	40-60
Eastern White	<i>Pinus strobus</i>	Fastigiata (narrow/columnar when young)	2		2	2	1	50-80
Loblolly Pine	<i>Pinus taeda</i>		3		1	1	1	60-90

Root Structure: 1-taproot, 2-deep laterals/some shallow, 3-shallow rooting; Crown Phenology: 1-late spring leaf out/early fall leaf drop, 2-mid-spring leaf out/mid-fall leaf drop, 3-early spring leaf out/late fall leaf drop; Crown Width: 1-less than 35 ft, 2-35-50 ft, 3-greater than 50 ft; Crown Density: 1-open branching/light shade; 2-moderate branching/shade; 3-heavy branching/shade; Growth Rate: 1-Fast, 2-Moderate, 3-Slow

Table 3b. Deciduous Physical Characteristics

Common Name	Scientific Name	Cultivars	Root Structure	Crown Phenology	Crown Width	Crown Density	Growth Rate	Mature Height (ft)
Sugar Maple	<i>Acer saccharum</i>	Caddo, Commemoration, Legacy (heat and drought resistant); Temples Upright (narrow crown)	3	2	3	3	2.5	75-120
Pawpaw	<i>Asimina triloba</i>	Many	2	1	1	1.5	2.5	25-35
Hardy Pecan	<i>Carya illinoensis</i>	Many	1	2	3	1	2.5	70-100
Persimmon	<i>Diospyros virginiana</i>	Hicks, Meader, Pieper, Rnkwitz, Early Golden, John Rick, Killen, Miller, and Woolbright	1	2	1	1	2.5	35-60
Thornless Honey Locust	<i>Gleditsia triacanthos var. inermis</i>	Millwood, Calhoun, Hershey (seed pods w/ high sugar content)	2.5	1	2	1	1	50-70
Butternut	<i>Juglans cinerea</i>	Kenworthy, Mitchell	1.5	1	3	1	2	40-60
Black Walnut	<i>Juglan nigra</i>	Many	1.5	1	3	1	1	50-75
Yellow Poplar	<i>Liriodendron tulipifera</i>		2.5	1.5	2	2	1	70-90
Red Mulberry	<i>Morus rubra</i>	Johnson, Weisman, Cooke, Wellington	2	1	2	3	1	40-70
White Oak	<i>Quercus alba</i>		2	2	3	2	3	50-80
Bur Oak	<i>Quercus macrocarpa</i>	Urban Pinnacle (narrow/pyramidal)	2	2	3	2	3	70-80
Cherrybark Oak	<i>Quercus pagoda</i>		2		3	2	1	80-100
Northern Red Oak	<i>Quercus rubra</i>		3	2	3	3	1.5	60-75
Shumard Oak	<i>Quercus shumardii</i>		2	2	3	1.5	1.5	40-60
Black Locust	<i>Robinia pseudoacacia</i>	Appalachia, Allegheny, Algonquin	3	1	1	1	1	30-50
Baldcypress	<i>Taxodium distichum</i>	Shawnee Brave (pyramidal), Fastigiata (narrow/upright)	3	2	1	1	2	50-70

Root Structure: 1-taproot, 2-deep laterals/some shallow, 3-shallow rooting; Crown Phenology: 1-late spring leaf out/early fall leaf drop, 2-mid-spring leaf out/mid-fall leaf drop, 3-early spring leaf out/late fall leaf drop; Crown Width: 1-less than 35 ft, 2-35-50 ft, 3-greater than 50 ft; Crown Density: 1-open branching/light shade; 2-moderate branching/shade; 3-heavy branching/shade; Growth Rate: 1-Fast, 2-Moderate, 3-Slow

Table 4a: Evergreen Utility and Maintenance

Common Name	Scientific Name	Cultivars	Markets	FODDER Product (Fruit, Nut, Leaf)	Pest/Disease Issues
Shortleaf Pine	<i>Pinus echinata</i>		T, NT		2
PitchLob	<i>Pinus rigida x taeda</i>		T		
Eastern White	<i>Pinus strobus</i>	Fastigiata (narrow/columnar when young)	T, NT		2
Loblolly Pine	<i>Pinus taeda</i>		T, NT		1

Markets: T-timber and other wood products, NT-non-timber forest products, FW-firewood, P-posts; Pests/Disease Issues: 1-few, 2-some, 3-many

Table 4b: Deciduous Utility and Maintenance

Common Name	Scientific Name	Cultivars	Markets	FODDER Product (Fruit, Nut, Leaf)	Pest/Disease Issues
Sugar Maple	<i>Acer saccharum</i>	Caddo, Commemoration, Legacy (heat and drought resistant); Temples Upright (narrow crown)	T, FW, NT		2
Pawpaw	<i>Asimina triloba</i>	Many	NT		1
Hardy Pecan	<i>Carya illinoensis</i>	Many	T, FW, NT		3
Persimmon	<i>Diospyros virginiana</i>	Hicks, Meader, Pieper, Rnkwitz, Early Golden, John Rick, Killen, Miller, and Woolbright	T, FW, NT		1
Thornless Honey Locust	<i>Gleditsia triacanthos var. inermis</i>	Millwood, Calhoun, Hershey (seed pods with high sugar content)	T, FW, P	 	2
Butternut	<i>Juglans cinerea</i>	Kenworthy, Mitchell	T, NT		3
Black Walnut	<i>Juglan nigra</i>	Many	T, NT		3
Yellow Poplar	<i>Liriodendron tulipifera</i>		T, LV		1
Red Mulberry	<i>Morus rubra</i>	Johnson, Weisman, Cooke, Wellington	NT	 	2
White Oak	<i>Quercus alba</i>		T, FW, NT	 	2
Bur Oak	<i>Quercus macrocarpa</i>	Urban Pinnacle (narrow/pyramidal)	T, FW	 	1
Cherrybark Oak	<i>Quercus pagoda</i>		T, FW	 	2
Northern Red Oak	<i>Quercus rubra</i>		T, FW	 	2
Shumard Oak	<i>Quercus shumardii</i>		T, FW		2
Black Locust	<i>Robinia pseudoacacia</i>	Appalachia, Allegheny, Algonquin	T, FW, P		1
Baldcypress	<i>Taxodium distichum</i>	Shawnee Brave (pyramidal), Fastigiata (narrow/upright)	P		1

Markets: T-timber and other wood products, NT-non-timber forest products, FW-firewood, P-posts;  - Fruits  - Nuts  - Leaves; Pests/Disease Issues: 1-few, 2-some, 3-many.

*\*Heavy consumption of oak leaves and acorns can be toxic to some livestock.*

Table 5a: Evergreen Other Benefits

Common Name	Scientific Name	Cultivars	Wildlife	Bee Forage	Fall Color	Erosion Control	Windbreak	Nitrogen Fixation
Shortleaf Pine	<i>Pinus echinata</i>		●				●	
PitchLob	<i>Pinus rigida x taeda</i>		●			●		
Eastern White	<i>Pinus strobus</i>	Fastigiata (narrow/columnar when young)	●					
Loblolly Pine	<i>Pinus taeda</i>		●			●		

● indicates the species offers the benefit

Table 5b: Deciduous Other Benefits

Common Name	Scientific Name	Cultivars	Wildlife	Bee Forage	Fall Color	Erosion Control	Windbreak	Nitrogen Fixation
Sugar Maple	<i>Acer saccharum</i>	Caddo, Commemoration, Legacy (heat and drought resistant); Temples Upright (narrow crown)	●		●			
Pawpaw	<i>Asimina triloba</i>	Many	●		●			
Hardy Pecan	<i>Carya illinoensis</i>	Many						
Persimmon	<i>Diospyros virginiana</i>	Hicks, Meader, Pieper, Rnkwitz, Early Golden, John Rick, Killen, Miller, and Woolbright	●	●		●		
Thornless Honey Locust	<i>Gleditsia triacanthos var. inermis</i>	Millwood, Calhoun, Hershey (seed pods w/ high sugar content)	●	●	●	●	●	
Butternut	<i>Juglans cinerea</i>	Kenworthy, Mitchell						
Black Walnut	<i>Juglan nigra</i>	Many						
Yellow Poplar	<i>Liriodendron tulipifera</i>			●	●			
Red Mulberry	<i>Morus rubra</i>	Johnson, Weisman, Cooke, Wellington	●					
White Oak	<i>Quercus alba</i>		●					
Bur Oak	<i>Quercus macrocarpa</i>	Urban Pinnacle (narrow/pyramidal)	●				●	
Cherrybark Oak	<i>Quercus pagoda</i>		●					
Northern Red Oak	<i>Quercus rubra</i>		●		●			
Shumard Oak	<i>Quercus shumardii</i>		●		●			
Black Locust	<i>Robinia pseudoacacia</i>	Appalachia, Allegheny, Algonquin		●		●		●
Baldcypress	<i>Taxodium distichum</i>	Shawnee Brave (pyramidal), Fastigiata (narrow/upright)			●	●		

● indicates the species offers the benefit

Table 6a: Evergreen Special Considerations

Common Name	Scientific Name	Cultivars	Special Considerations
Shortleaf Pine	<i>Pinus echinata</i>		Maintains tall, clear trunk w/o early pruning.
PitchLob	<i>Pinus rigida x taeda</i>		Combines the fast growth rate and drought resistance of loblolly pine, with the cold tolerance of pitch pine. A good choice for cooler zones.
Eastern White	<i>Pinus strobus</i>	Fastigiata (narrow/columnar when young)	Best growth at higher elevations and cooler zones. Poor performance in heavy soils and hot temperatures common in piedmont areas.
Loblolly Pine	<i>Pinus taeda</i>		Grows well in red-clay soils; 'genetically superior' seedlings (increased growth rate) may be available through your local forest service office.

Table 6b: Deciduous Special Considerations

Common Name	Scientific Name	Cultivars	Special Considerations
Sugar Maple	<i>Acer saccharum</i>	Caddo, Commemoration, Legacy (heat and drought resistant); Temples Upright (narrow crown)	Maple syrup production at 10"dbh or greater; consult local extension office for varieties exhibiting high sugar content; use heat-tolerant cultivars for zones 7-8.
Pawpaw	<i>Asimina triloba</i>	Many	Use superior fruiting varieties/cultivars for marketable fruit; trees can sucker and produce colonies; small container-grown plants transplant best.
Hardy Pecan	<i>Carya illinoensis</i>	Many	Select cultivars/varieties are recommended for marketable nuts and disease/pest resistance.
Persimmon	<i>Diospyros virginiana</i>	Hicks, Meader, Pieper, Rnkwitz, Early Golden, John Rick, Killen, Miller, and Woolbright	Use cultivars or grafted trees (D. kaki (Asian) grafted onto D. virginiana) for marketable fruits; trees may sucker and form colonies.
Thornless Honey Locust	<i>Gleditsia triacanthos var. inermis</i>	Millwood, Calhoun, Hershey (seed pods w/ high sugar content)	If planting for fodder, use cultivars that produce seed pods with high sugar content, avoid cultivars from horticulture suppliers that are bred for little to no fruit production. Avoid clay soils.
Butternut	<i>Juglans cinerea</i>	Kenworthy, Mitchell	Develops a short trunk w/o early pruning; nuts are sweeter than black walnut; loves limestone soils; susceptible to 1000 cankers disease.
Black Walnut	<i>Juglan nigra</i>	Many	Maintains a tall, clear trunk often w/o early pruning; loves limestone soils; susceptible to 1000 cankers disease; extremely valuable wood, esp. mature veneer.
Yellow Poplar	<i>Liriodendron tulipifera</i>		Tall, clear trunk often free of branches w/o early pruning.
Red Mulberry	<i>Morus rubra</i>	Johnson, Weisman, Cooke, Wellington	
White Oak	<i>Quercus alba</i>		Oaks in general, and white oaks in particular vary by individuals in how early they leaf out and how late they drop their leaves. Additionally, some individuals may hold onto many (dead) leaves into the winter.
Bur Oak	<i>Quercus macrocarpa</i>	Urban Pinnacle (narrow/pyramidal)	Favors limestone soils in upland sites; very drought resistant.
Cherrybark Oak	<i>Quercus pagoda</i>		Some leaves persist in winter.
Northern Red Oak	<i>Quercus rubra</i>		
Shumard Oak	<i>Quercus shumardii</i>		
Black Locust	<i>Robinia pseudoacacia</i>	Appalachia, Allegheny, Algonquin	Rot resistant wood. High protein forage, however toxicity can develop if animals consumer too much.
Baldcypress	<i>Taxodium distichum</i>	Shawnee Brave (pyramidal), Fastigiata (narrow/upright)	Cypress knees do not form on drier sites.

# Silvopasture Tree Selection Worksheet

Follow these steps to select the best trees for your silvopasture operation.

## 1. Assess Your Site

Your Zone \_\_\_\_\_

Test your soil. Obtain an analysis of each unique field/area you intend to plant.

### FIELD 1

Soil Moisture \_\_\_\_\_ (W-wet, M-moist, D-dry, X-well-drained)

Soil Type \_\_\_\_\_

pH \_\_\_\_\_

Expected site extremes \_\_\_\_\_ (drought, flooding, wind/ice)

### FIELD 2

Soil Moisture \_\_\_\_\_ (W-wet, M-moist, D-dry, X-well-drained)

Soil Type \_\_\_\_\_

pH \_\_\_\_\_

Expected site extremes \_\_\_\_\_ (drought, flooding, wind/ice)

## 2. List Tree Species Suitable for the Site Conditions – Use the chart to identify tree species best adapted to the conditions in each field. Record them here.

FIELD 1 \_\_\_\_\_  
\_\_\_\_\_

FIELD 2 \_\_\_\_\_  
\_\_\_\_\_

## 3. Identify Your Goals – Describe what you want to accomplish with your silvopasture. List the services you would like your trees to provide.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## 4. Make Your Final List of Trees! – From the list above, identify the species that best accomplish your goals and objectives. Contact local suppliers to ensure those species are available at the time and in the size needed.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_