Selecting Trees and Shrubs for Conservation Plantings

KANSAS FOREST SERVICE

REVISED JULY 2024

Right Plant, Right Place

Successfully growing trees and shrubs in Kansas depends on the selection of appropriate plants for the intended site. Matching growing conditions and space available at the planting location with the intended suitability and functionality of each plant will determine the most suitable species to be planted.

Plant Selection

The following tables illustrate the tolerance of individual trees and shrubs to various environmental conditions as well as the growth habits and ideal utility of each species. The trees and shrubs listed here are recommended by industry professionals such as Kansas Forest Service staff, local conservation boards, wildlife professionals, USDA Natural Resource Conservation Service staff, and other research based conservation agencies. For a more extensive list of urban tree recommendations, refer to the KFS preferred tree lists located on the KFS website under community forestry resources.

Plant availability

All species listed here are typically available for purchase from the KFS Conservation Tree and Shrub program as bare root or containerized seedlings each spring and fall. Stratified seed from species which have demonstrated success from direct seeding efforts may also be available. KFS continues to assess new plant material each year to provide access to healthy, affordable seedlings which are appropriately adapted to Kansas environments.

Conservation Planning

Help with conservation plan development is available for windbreaks, riparian buffers, wildlife habitat, forest stand improvement, and other recreational, landscape, and/or ecological plantings. Contact your KFS district forester for more information (see back panel).

Using this Guide

Three tables are provided to separate deciduous trees, evergreen trees, and shrubs. Use the indicators below to assess species suitability for your planting.

Environmental Tolerances

The left side of each chart indicates the tolerance of each species to environmental conditions including drought and flooding.

Growth Traits and Utility

The right side of each chart includes information on growth rate, height, and spread of each species. Utility of each species for each of the following planting types is also included:

- Windbreaks 
- Wildlife habitat and forage 
- Insect/pollinator habitat and/or forage 
- Christmas trees 
- Timber products 

Suitable Locations

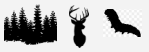
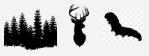
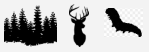
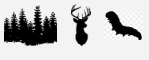
Regional suitability of each plant is listed according to KFS rural forestry district (Page 6). Each plant may be listed as:

- Adapted and suitable for use (S)
- Not adapted for use (NA)
- Not recommended for use (NR)

Native vs. Introduced

Plant origin is indicated by the color of each species name. Though a few species chosen for this list are introduced/exotic, they were included because they have not demonstrated a tendency to spread aggressively and because they may fill a specific niche where native alternatives are lacking.

Shrubs

Environment			KFS Rural Forestry District							Growth Traits			
Flood Tolerance	Drought Tolerance	Species	NW	SW	NC	SC	EC	NE	SE	Growth Rate	Height (ft)	Spread (ft)	Function
Very Low	Medium	**American Plum** *Prunus americana*	S	S	S	S	S	S	S	Medium	6-10	6-12	
Very Low	High	**Buffaloberry** *Shepherdia argentea*	S	S	S	S	NR	NR	NR	Medium	6-12	6-12	
High	Medium	**Buttonbush** *Cephalanthus occidentalis*	S	S	S	S	S	S	S	Medium	6-15	6-10	
Low	High	**Chokecherry** *Prunus virginiana*	S	S	S	S	S	S	S	Fast	6-18	6-12	
Very Low	High	**Dwarf Chinkapin Oak** *Quercus prinoides*	S	S	S	S	S	S	S	Slow	12-20	12-20	
High	Medium	**Elderberry** *Sambucus canadensis*	S	S	S	S	S	S	S	Fast	5-7	6-10	
High	Medium	**False Indigo** *Amorpha fruticosa*	S	S	S	S	S	S	S	Medium	4-6	4-6	
Very Low	High	**Fragrant Sumac** *Rhus aromatica*	S	S	S	S	S	S	S	Medium	3-8	6-8	
Low	Medium	**Golden Currant** *Ribes aureum*	S	S	S	S	S	S	S	Medium	3-5	3-5	
Low	Medium	**Hazelnut** *Corylus americana*	NA	NA	S	NA	S	S	S	Fast	6-12	6-12	
Low	High	**Lilac** *Syringa vulgaris*	S	S	S	S	S	S	S	Slow	8-12	6-10	
Very Low	High	**New Jersey Tea** *Ceanothus americanus*	NA	NA	S	S	S	S	S	Slow	1-3	3-5	
Very High	Medium	**Common Ninebark** *Physocarpus orbiculatus*	NA	NA	S	S	S	S	S	Slow	6-12	6-12	
Very High	Medium	**Redtwig Dogwood** *Cornus sericea*	S	S	S	S	S	S	S	Fast	6-12	6-12	
Low	Medium	**Rusty Blackhaw** *Viburnum rufidulum*	NA	NA	S	S	S	S	S	Medium	10-20	10-20	
Very Low	High	**Sandhill Plum** *Prunus angustifolia*	S	S	S	S	S	S	S	Medium	6-10	3-4	
Medium	Medium	**Serviceberry** *Amelanchier arborea*	NA	NA	NA	NA	S	S	S	Medium	15-25	15-25	
Medium	Low	**Spicebush** *Lindera benzoin*	NA	NA	NA	NA	NA	NA	S	Slow	6-12	6-12	

Black = Native to Kansas **Blue = Native to USA** **Red = Introduced / Exotic**

Deciduous Trees

Environment			KFS Rural Forestry District							Growth Traits			
Flood Tolerance	Drought Tolerance	Species	NW	SW	NC	SC	EC	NE	SE	Growth Rate	Height (ft)	Spread (ft)	Function
Low	Medium	**American Hophornbeam** *Ostrya virginiana*	NA	NA	NA	NA	S	S	S	Slow	20-50	15-30	
High	Medium	**Baldcypress** *Taxodium distichum*	S	S	S	S	S	S	S	Medium	60-100	20-30	
Low	Low	**Basswood** *Tilia americana*	NA	NA	S	NA	S	S	S	Medium	75-100	50-75	
Medium	Medium	**Bitternut Hickory** *Carya cordiformis*	NA	NA	S	S	S	S	S	Slow	50-80	50-80	
Very Low	Medium	**Black Cherry** *Prunus serotina*	NA	NA	S	S	S	S	S	Fast	50-80	30-50	
Very Low	Medium	**Black Oak** *Quercus velutina*	NA	NA	S	S	S	S	S	Medium	50-60	50-60	
Medium	Medium	**Black Walnut** *Juglans nigra*	S	S	S	S	S	S	S	Medium	70-90	30-40	
High	Low	**Black Willow** *Salix nigra*	S	S	S	S	S	S	S	Fast	30-40	30-40	
Low	High	**Blackjack Oak** *Quercus marilandica*	NA	NA	S	S	S	S	S	Slow	30-40	30-40	
Medium	High	**Bur Oak** *Quercus macrocarpa*	S	S	S	S	S	S	S	Medium	50-80	40-60	
Medium	High	**Catalpa** *Catalpa speciosa*	S	S	S	S	S	S	S	Fast	50-60	30-40	
Very Low	High	**Chinkapin Oak** *Quercus muehlenbergii*	S	S	S	S	S	S	S	Medium	30-60	20-40	
High	Medium	**Cottonwood** *Populus deltoides*	S	S	S	S	S	S	S	Fast	70-100	50-70	
Medium	High	**English Oak** *Quercus robur*	NR	S	NR	NR	NR	NR	NR	Medium	30-40	30-40	
Medium	High	**Hackberry** *Celtis occidentalis*	S	S	S	S	S	S	S	Fast	60-80	60-80	
Medium	High	**Kentucky Coffeetree** *Gymnocladus dioica*	S	S	S	S	S	S	S	Medium	75-100	50-75	
Low	Medium	**Northern Red Oak** *Quercus rubra*	NA	NA	S	S	S	S	S	Medium	50-75	40-60	
Medium	High	**Osage Orange** *Maclura pomifera*	S[1]	S[1]	S[1]	S[1]	S[1]	S[1]	S[1]	Medium	30-50	30-50	
Low	Low	**Paw Paw** *Asimina triloba*	NA	NA	S	S	S	S	S	Medium	15-30	20-30	
Medium	Medium	**Pecan** *Carya illinoinensis*	NA	NA	S	S	S	S	S	Slow	80-100	75-100	

[1] Osage orange (hedge) can spread aggressively in rangeland and grassland. Post-planting grassland management strategies to minimize spread are strongly encouraged.

Deciduous Trees (continued)

Environment			KFS Rural Forestry District							Growth Traits			
Flood Tolerance	Drought Tolerance	Species	NW	SW	NC	SC	EC	NE	SE	Growth Rate	Height (ft)	Spread (ft)	Function
Medium	Medium	**Persimmon** *Diospyros virginiana*	S	NA	S	S	S	S	S	Medium	20-60	20-40	
Very High	Medium	**Pin Oak** *Quercus palustris*	NA	NA	NA	S	S	S	S	Fast	60-70	20-40	
High	High	**Post Oak** *Quercus stellata*	NA	NA	NA	NA	S	S	S	Slow	40-50	30-40	
Medium	High	**Red Mulberry** *Morus rubra*	S	S	S	S	S	S	S	Medium	30-50	30-50	
Medium	Medium	**Redbud** *Cercis canadensis*	S	S	S	S	S	S	S	Medium	10-20	15-20	
Very High	Low	**Sandbar Willow** *Salix interior*	S	S	S	S	S	S	S	Fast	15-20	15-20	
Low	Medium	**Shagbark Hickory** *Carya ovata*	NA	NA	S	NA	S	S	S	Medium	65-90	35-50	
Medium	Medium	**Shellbark Hickory** *Carya laciniosa*	NA	NA	NA	NA	S	S	S	Slow	60-100	35-50	
Medium	Medium	**Shumard Oak** *Quercus shumardii*	NA	NA	S	S	S	S	S	Medium	60-80	35-50	
High	Medium	**Silver Maple** *Acer saccarinum*	NA	NA	S	S	S	S	S	Fast	70-80	50-60	
High	Medium	**Swamp White Oak** *Quercus bicolor*	S	S	S	S	S	S	S	Fast	50-70	40-60	
Medium	Medium	**Sycamore** *Platanus occidentalis*	S	S	S	S	S	S	S	Fast	75-100	75-100	
Low	High	**Western Soapberry** *Sapindus drummondii*	S	S	S	S	S	S	S	Medium	18-28	18-28	
Low	Medium	**White Oak** *Quercus alba*	NA	NA	S	NA	S	S	S	Slow	60-80	60-80	

Black = Native to Kansas **Blue = Native to USA** **Red = Introduced / Exotic**

Site Considerations

Site specific characteristics such as soil texture and pH, irrigation needs, herbicide tolerance, disease and pest pressure, climate, and planned maintenance practices should be considered when determining suitable species selection. Many of these variables (pH, climate, disease and pest pressure) are included in these tables via KFS district suitability, though not every planting site and situation may be represented. For unusually high or low soil pH, sandy textures, ornamental plantings, or for locations which may not allow for irrigation, consult your district forester (see back panel).

Fruit Trees

Interested in establishing fruit or nut orchards? Unique cultivars selected for optimal fruit production are not offered through the KFS Conservation Tree Program. Most of our planting stock is composed of seedlings (grown from seed) which (unlike specific cultivars) are genetically variable. Consult with K-State Research and Extension—Horticulture for information on selection, purchasing availability, planting, pruning, and maintenance.

Publications on fruit and nut trees can be found online at https://www.ksre.k-state.edu/program-areas/lawn-and-garden/fruit-and-vegetable-gardening.html

Evergreen Trees

Environment			KFS Rural Forestry District							Growth Traits			
Flood Tolerance	Drought Tolerance	Species	NW	SW	NC	SC	EC	NE	SE	Growth Rate	Height (ft)	Spread (ft)	Function
Low	Low	**Black Hills Spruce** *Picea glauca 'Densata'*	NA	NA	S	NA	NA	S	NA	Slow	40-50	10-20	
Low	High	**Eastern Redcedar**[1] *Juniperus virginiana*	S	S	S	S	S	S	S	Medium	30-35	12-15	
Low	Low	**Eastern White Pine**[4] *Pinus strobus*	NA	NA	NA	NA	S*	S*	S*	High	50-80	20-30	
Medium	Medium	**Oriental Arborvitae** *Platycladus orientalis*	S	NR	S	S	S	S	S	Fast	15-30	12-15	
Low	High	**Ponderosa Pine**[3] *Pinus ponderosa*	S*	S*	S*	S*	S*	S*	S*	Medium	40-50	20-25	
Very Low	High	**Rocky Mountain Juniper**[2] *Juniperus scopulorum*	S*	S*	NA	NA	NA	NA	NA	Medium	20-30	8-12	
Very Low	High	**Southwestern White Pine** *Pinus strobiformis*	S*	S*	S*	S*	S*	S*	S*	Medium	35-50	25-40	

= Species suitable for planting in Christmas tree farms

*Pesky Pines

Kansas is one of few states without a native pine tree species. All pines listed above are native to the USA, though some may not be adapted to every Kansas site. High pH soils, pest pressure, and "Kansas climate" which is often too dry, wet, hot, and/or cold (sometimes all in the same day) can severely stress maturing pines, causing high potential for loss of function and mortality. Specific considerations for each pine are listed below.

Though not currently problematic for the pines included above, uncertainties with regard to future susceptibility of the pine wilt disease warrant judicious use of all pine species in windbreaks.

[3]*Ponderosa Pine*

Ponderosa pine is susceptible to a variety of pests (wildlife browse, Zimmerman Pine Moth, Nantucket Pine Tip Moth) and diseases (Dothistroma needle blight, Diplodia tip blight) and tends to lose lower limbs as it matures. If chosen for windbreak purposes, fungicide applications and planting supplemental rows of shrubs for lower level wind protection will be necessary to maintain a functional windbreak.

[4]*Eastern White Pine*

Eastern White Pine is poorly adapted to the high pH soils and wind experienced in many parts of Kansas. On lower pH sites, EWP may be used for interior rows of multi-row windbreaks where wind intensity is reduced.

Other Evergreen Considerations

Struggles presented by Kansas site conditions limit the list of suitable evergreen species for planting. See below for information on other evergreens listed in the chart above.

[1]*Eastern Red Cedar*

Eastern red cedar is a valuable component of windbreaks. However, to reduce potential encroachment into sensitive grassland habitats, ERC should only be recommended for windbreak plantings where suitable alternatives are not available. Integrated forestry and grassland management plans are encouraged to treat ERC escape.

[2]*Rocky Mountain Juniper*

Rocky Mountain Juniper is sensitive to humidity and requires low minimum temperatures. For greater longevity, RMJ should only be planted within 75 miles of the Kansas-Colorado border.

References and Relevant Publications

KFS Publications

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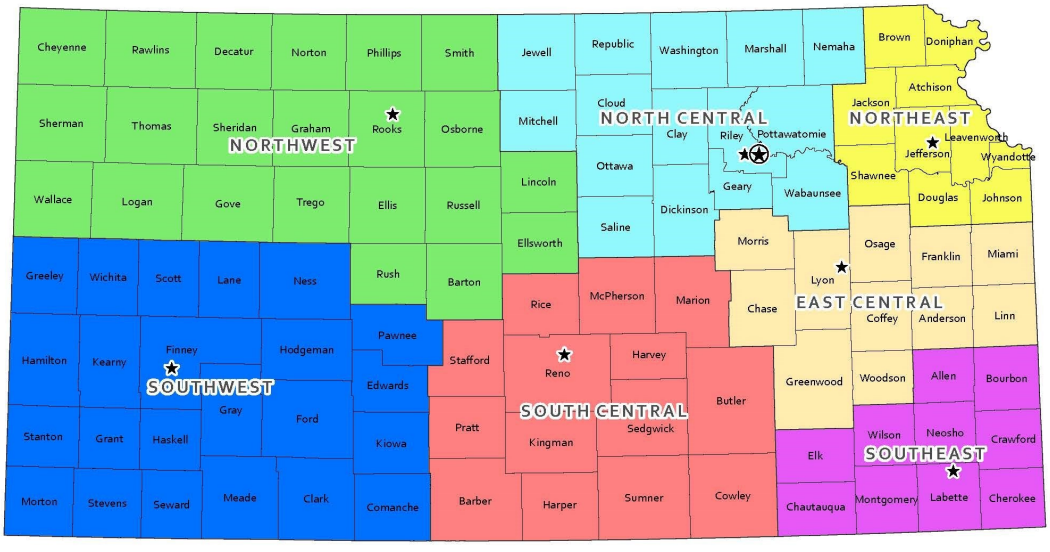
Rural Forestry Districts



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