



Tree and Shrub Planting



Tree and shrub planting in riparian areas reestablishes native riparian forests by hand planting or machine planting nursery-grown seedlings (Figure 1.) The practice applies to all riparian areas on intermittent and perennial stream channels where natural forest vegetation is lacking. This usually consists of planting a mix of species to obtain a variety of benefits, including bank stabilization, improved water quality, wildlife habitat, and timber production. Tree and shrub planting also can be used to supplement natural revegetation, to obtain a better mix of species, or to concentrate plants in a critical area. This practice is often one component of an overall riparian management plan to control bank erosion or address other concerns.

Benefits and Value

Riparian forests are critical to the protection and enhancement of the water resources of Kansas. Forests located directly adjacent to streams, rivers, and other bodies of water improve water quality by filtering sediment and pollutants from overland flow. They also hold erosive soils in place and decrease streambank erosion by slowing damaging flood waters. Riparian forests are diverse ecosystems that provide valuable wildlife and



Figure 1. Machine planting nursery grown seedlings.

fishery habitat and support high-value timber species.

Kansas has been losing these valuable riparian forests at an alarming rate. This loss has come about as a result of land clearing and overgrazing that has left many areas vulnerable to flooding. These productive and useful forests are not being replaced, and many acres of valuable bottomland soil have been lost as a result.

However, riparian vegetation can recover quickly from disturbance. In many cases “backing off” from the bank of the stream will be enough to let the area naturally

revegetate, but planting the area can accelerate recovery. By planting trees and shrubs, the landowner can regain lost benefits and control the species and location of the individual plants. This may result in a high economic return in the future. The economic returns may be direct, by producing harvestable timber, or indirect, by reducing soil erosion, improving water quality, or increasing wildlife habitat.

The cost of this practice includes seedlings and planting materials, use of equipment, and labor. The cost is normally quite low per acre. The largest cost of planting trees and shrubs is in removing the area from the crop production base or the loss of grazing area. This cost is offset by the benefits that the planting will return. These may not all be immediate cash-flow benefits, but they still provide valuable returns to the landowner.

Implementation of Practice

Before trees and shrubs are planted, several important factors must be considered. The size of the planting will depend on the objectives of the landowner. The minimum recommended width of a planting that is intended to protect water quality is 66 feet on each side

Table 1. Flood tolerance listing of Kansas tree species.

Flood Tolerant Species (can withstand flooding for most of one growing season)

Black willow	Peach-leaved willow	Silver maple
Green ash	Sandbar willow	Sycamore

Intermediate Flood-Tolerant Species (can withstand flooding for 1 to 3 months during growing season)

American elm	Hackberry	Pin Oak
Basswood (linden)	Honeylocust	River birch
Bitternut hickory	Mulberry	Shumard's oak
Bur oak	Osage-orange	Sugar maple
Catalpa	Pecan	Sweetgum
Eastern Cottonwood	Persimmon	

Flood-Intolerant Species (cannot withstand flooding for a period of a month or more during the growing season)

Black cherry	Eastern red cedar	Shagbark hickory
Black oak	Mockernut hickory	Shingle oak
Black walnut	Northern red oak	Slippery elm
Blackjack oak	Post oak	White oak
Chinkapin oak		

of the stream. This can be reduced or expanded based on other benefits that are desired from the planting. Other important considerations are soil type and available moisture in the area to be planted.

Many tree species are site-specific, so it is important to choose species that are suited to the area. Many riparian areas contain deep, highly productive soils. In these cases, the list of suitable species will be expanded, but it is important to consider available moisture and flooding patterns. Trees and shrubs vary in their ability to survive flooding (Table 1). It is important to remember that the ability of a tree to survive flooding also will depend on soil type, soil structure, time of flooding, and the condition of the trees before flooding. Final species and planting design decisions should be based on the objectives of the landowner and the recommendations of a natural resource professional.

improved wildlife habitat, and long-term timber production. Remember, individual plans should be tailored to the site conditions and the objectives of the planting.

Before installing a riparian planting, prepare the site. This

The final planting plan will usually contain a variety of species planted in rows or blocks. The species will change as you move from the wetter soils near the channel up the slope to the drier soils. Figure 2 shows a typical planting plan. This diagram is to be used as an example, assuming a deep, well-drained soil with infrequent flooding. The objectives of this planting are decreased soil erosion,

would include removing existing weeds and grasses that compete with seedlings. Thoroughly till (to bare mineral soil) 6- to 10-foot wide strips where the tree rows will be located, or kill all vegetation in a 6-foot wide strip using an approved herbicide. Existing vegetation or crop residue between the strips can be left to reduce soil erosion. An alternative technique to strip site preparation is to spot-treat four-foot diameter planting circles with a post emergent herbicide. Site preparation is best done the year prior to planting.

Seedlings can be planted by hand or by using a mechanical tree planter. It is important to follow proper handling and planting directions. Your District Forester or District Conservationist can help you locate a tree planting contractor or can arrange to loan you a tree planting machine or planting bars. After the seedlings are planted, apply a weed barrier fabric or pre-emergent herbicide according to the recommendation of a natural resource specialist. Only use weed barrier fabric in areas where flood waters will not tear the barrier and carry the material downstream or result in silt over the top of them.

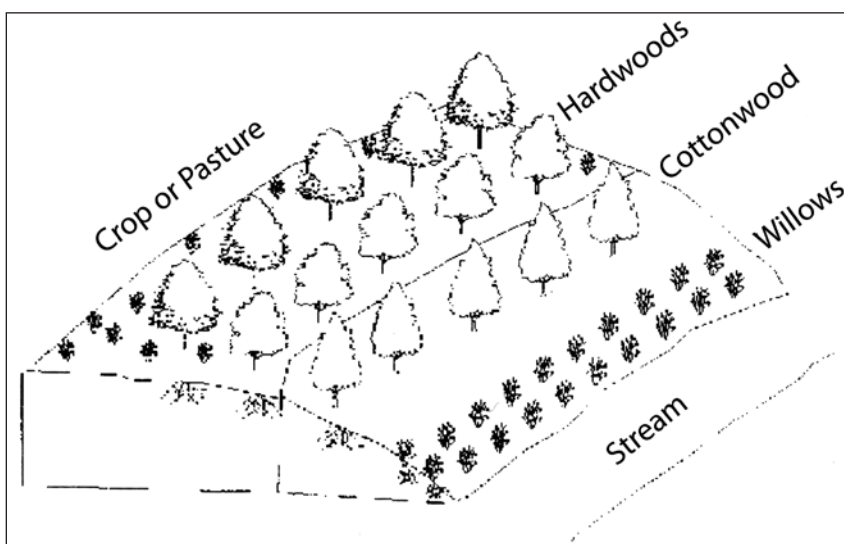


Figure 2. Example of a riparian tree and shrub planting.

Control weeds for at least 3 years after the seedlings are planted. Weed control can simply involve checking the weed barrier fabric for good contact with the soil surface, or it may require future herbicide application or mowing and disking.

For additional information on riparian tree and shrub planting, cost-share opportunities, or technical assistance, contact the Kansas Forest Service, your local Conservation District office, K-State Research and Extension office, Natural Resources Conservation Service office, or the Kansas Department of Wildlife and Parks.

References

Kansas Field Office Technical Guide, Section IV. Kansas standards and specifications for tree planting. USDA., Natural Resources Conservation Service.

Kansas Field Office Technical Guide, Section IV. Forestland Interpretations. USDA., Natural Resources Conservation Service.

Tree planting Guide, Kansas Forest Service. June 2004. L-596

Deborah Goard
Kansas Forest Service
2610 Claflin Road
Manhattan, KS 66502-2798
(785) 532-3300
www.kansasforests.org

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