



Willow Cuttings



Many eroding streambanks in Kansas have been devegetated through land conversion or floods. These areas of exposed soil are susceptible to scour erosion and bank sloughing.

The long-term solution to this problem is to reestablish vegetation along these areas. One of the most cost-effective means of revegetation is through the use of willow cuttings. On slightly or moderately eroding banks, this technique can be used as a primary practice. In cases of severe erosion, willow cuttings should be used in combination with a structural streambank stabilization technique, such as a tree revetment.

Benefits and Value

Severely eroding streambanks are caused by many different factors. Erosion on the outside bends of streams is a natural process that can be accelerated as a result of human activities, including removal of riparian (streamside) vegetation, channelization of streams, and improperly grazed riparian areas. These eroding areas concern landowners due to loss of productive bottomland, degrading water quality, and loss of vegetation. Roots of vegetation bind the soil profile and increase soil stability by many thousands of times. The

top growth of vegetation serves to slow running water and reduce surface scour when banks overflow.

Although eroding banks can be revegetated with tree and shrub seedlings, willow cuttings are cost effective and can withstand high water flows. Willow cuttings are simply sections of dormant willow stems that are driven into the ground vertically where they sprout and grow roots (Figure 1).

As these cuttings sprout, they provide wildlife cover, begin shading the stream, and serve as cover for fish. Using willow cuttings to control streambank erosion is most effective when incorporated into a “systems approach” to land and water management. This systems approach should include controlling runoff and reestablishing a riparian forest buffer along the stream.



Figure 1. Willow cuttings shortly after installation.

Implementation of Practice

Willow cuttings can be used on a wide variety of sites, but success depends on the size of the watershed, adjacent land uses, size of cuttings (both diameter and length), soil type, and slope of the bank. Willow cuttings may not be sufficient on sites where the toe (or bottom) of the slope is not stable, or where banks exceed 2:1 slope. In these cases, structural practices or bank sloping may need to be applied in conjunction with willow cuttings.

Cuttings can be gathered on the site or by obtaining permission to cut willow from nearby ponds, reservoirs, or streams. The cuttings should be gathered and installed during the dormant season, which is following leaf drop, but before bud break (usually October through March in Kansas). Cutting the willow can be accomplished

by using lopping shears, brush cutters, or a chain saw, depending on the size of the material to be gathered. When gathering willow cuttings, keep track of the top and bottom ends of the cuttings. This can be accomplished by making a slanted cut at the bottom (which also makes the cutting easier to drive into the ground) or by dipping the tops of the cutting in

a 50:50 mixture of white latex paint and water.

The species of willow used is as important as the handling and installation process. Sandbar and black willow (the two most common willow species in Kansas) have both been used successfully. Cottonwood and sycamore also sprout from cuttings and can be mixed (no more than 20 percent of total) in with the willow stakes (1- to 3-inch diameter), and posts (greater than 3-inch diameter).

As stream size increases, the diameter and length of the cuttings should also increase. This ensures that cuttings will not be washed away in high flows. Typical diameters range from 1 to 4 inches, with lengths ranging from 2 to 8 feet. Larger cuttings are more difficult to install, but also will withstand extreme flooding.

Cuttings should be kept moist when hauling and storing. At the site, the cuttings can be kept moist by placing them in the stream.

Cuttings should be staggered 3 to 4 feet apart with the first row at the water's edge or slightly into the stream. Small cuttings can be pushed into the soil by hand or pounded in with a wooden mallet or

dead blow hammer. It may be necessary to install large willow poles with a hydraulic auger.

The key to getting the cuttings to sprout is to drive them deep enough that the base of the cutting is at or below the water table. As you move up the bank, cuttings need to be driven deeper than those adjacent to the water's edge (Figure 2). Driving the cuttings down to the water table ensure that they will receive adequate moisture during the growing season.

Once the cuttings have become established and erosion has been reduced, more valuable species can be planted on the site. Maintenance on these projects is limited to controlling grazing and replacing areas where three or more adjacent cuttings have failed to sprout. In most cases, willows are extremely hardy and grow successfully if they are placed deep enough. The willows will not spread into adjacent fields or into the channel itself.

For additional information on willow cuttings, cost-share oppor-

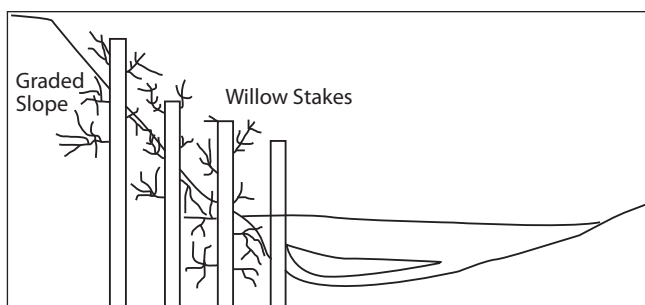


Figure 2. Willow post installed below depth of water table and streambed scour.

tunities, 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

- Illinois State Water Survey
Miscellaneous Publication 130
- Illinois State Water Survey
Miscellaneous Publication 149
Streams for the Future: Stream Restoration Specification.
1991. Missouri Department of Conservation

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

The Kansas Department of Health and Environment has provided financial assistance to this project through EPA Section 319 Nonpoint Source Pollution Control Grant #C9007405 11.



Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

Publications from Kansas State University are available on the World Wide Web at: www.oznet.ksu.edu

Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, credit Deborah Goard, *Riparian Forest Best Management Practices: Willow Cuttings*, Kansas State University, August 2006.