

Butler Soil & Water Conservation District

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- Ponds
- Trees
- Drainage
- Erosion Problems
- Wetland Identification
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Stream Bank Stabilization: Plants



Seeding a Streambank

Establishing vegetation on streambanks is often the simplest way to stabilize the soil and slow erosion. Where erosion is not severe, the banks can be seeded with warm or cool season grasses and legumes. Live tree cuttings can be inserted in the ground to give greater bank protection over a longer period of time.

Pros and Cons

- Seeding is useful when rich topsoil is readily available.
- Seeding is low-cost, particularly when compared to structural erosion control methods.
- Seeding should be part of all projects, including those making use of more complex structural erosion control methods.
- If used alone, seeding may not be adequate to control bank erosion, especially when erosion is severe.
- Seeding must be done during low flow conditions, and vegetation must have sufficient time to grow before high flow conditions occur. If the bank is seeded shortly before a high flow event, the roots may not be strong enough to keep the plants and soil from washing away.
- Seeding is generally not suitable for stabilizing the toe of a streambank, as few plants will survive below water level. See the Willow-Post method to stabilize bank slopes at the edge of the waterline.

Materials

- Seed mix using deep rooted grasses such as switchgrass, little bluestem, reed canary grass, Kentucky fescue, sideoats grams, and Canada wildrye.
- Straw as mulch or a commercially available erosion control blanket.

Preparation

- Regrade the slope no steeper than six feet horizontal to one foot vertical (6H: 1V). Always regrade by pulling dirt away from the stream to minimize the amount of soil discharged into the water.
- If the regraded bank does not contain adequate topsoil to support good vegetative growth, topsoil should be placed on the slope as needed.
- Additional bank stabilization can be obtained by installing a buffer strip of trees, shrubs, and grasses adjacent to the streambank.

Installation

There are several ways to apply seed:

- A liquid seed mixture can be sprayed
- The seeds can be evenly thrown on the bank and then covered with one-half inch of soil and lightly tamped to ensure contact with the soil. Straw or other suitable mulching material can also be used to provide initial bank stabilization and speed plant growth.
- Commercial seed mats can be used, giving more initial stabilization of the streambank and faster establishment.

Project Completion

The stabilization area doesn't need to look wild and unplanned. When mowing the lawn add a design by mowing a curve along the lawn and planted area.

Add color to the edge of the planted area with flowering plants.

You can even cut or mow view corridors, and/or make a pathway corridor to the stream. Use wood chips other soft materials that will soak up rain.

Stream Bank Erosion Plantings

Although any rooted plant growing on the streambank is helpful, some plants give better protection than others. Grasses and low shrubs are preferred because they develop relatively deep, strong, fibrous root systems that bind streambank soils. They also are less costly and become established faster than trees.

The grasses and shrubs listed can tolerate a wide range of temperature and moisture conditions; even survive under water for extended periods. They are easy to establish and maintain, and they provide good ground cover. They develop a strong, tough system of roots that tightly binds streambanks, traps silt, and slows erosion.

Recommended Species

Reed canary grass (*Phalaris arundinacea*)
Fescue Kentucky 31 (*Festuca arundinacea*)
Redtop grass (*Agrostis alba*)

Bankers dwarf willow (*Salix Cotteti*)
Streamco purpleozier willow (*Salix purpurea*)
Black Willow (*Salix nigra*)
Grey stem dogwood (*Cornus racemosa*)
Silky dogwood (*Cornus amomum*)
Red Osier dogwood (*Cornus stolonifera*)
Buttonbush (*Cephalanthus occidentalis*)
Ninebark *Physocarpus opulifolius*
Arrow Wood (*Viburnum dendantum*)
Nannyberry (*Viburnum lentago*)
Spicebush (*Lindeara benzoin*)
Winterberry (*Ilex verticillata*)
Eldeberry (*Sambucus Canadensis*)

Of the grasses listed, reed canary grass is widely planted for streambank stabilization. It provides year-round support for banks and a fringe of overhanging streamside cover for sportfish. This fast-growing, early developing grass grows in thick stands that reach heights of 4 to 7 feet. It can be controlled by cutting, but cannot tolerate livestock grazing. Since this grass may block flows on small streams, avoid seeding it on streams that are less than 4 feet wide.

Willows (*Salix*), unlike other trees and woody shrubs, are water-loving plants that develop relatively deep, strong root systems in wet soil. Many types of willows grow in the U.S., but most are unsuitable for streambank plantings because they grow rapidly and form tall, dense, nearly impenetrable thickets. Thick streamside stands can block stream channels and shade out beneficial plants.

The willows listed are varieties that have proved to be useful streambank protectors. Bankers dwarf willow is a low growing (maximum height of 6 feet), hardy shrub recommended for bank protection on small streams (4 to 20 feet in width). Streamco purpleozier willow (basket willow) is a taller plant (maximum height of 15 feet) used for planting on larger streams (greater than 20 feet in width).

These plants and others are available from nurseries, can be transplanted from existing stands, or started from cuttings.

Survival of streamside vegetation depends on proper planting and care until the plants are firmly established. Bank shaping, weeding, fertilization, mulching, and fencing from livestock may be necessary.

Live Planting Live Stakes

Live staking is the placement of woody plant and tree cuttings on a graded streambank to grow and stabilize the streambank by the formation of roots and aboveground brush.

Pros and Cons

- To increase the resistance to erosion immediately after placement, erosion control fabric can be used to protect the slope and still allow the cuttings to grow. The natural formation of the interlocking roots secures the erosion control fabric and prevents gullies from forming. The roots and woody portion of trees, shrubs, and grasses slow the flow of water in high water stages.
- Staking a streambank helps dry out a wet, unstable bank and allows it to become more stable.
- This method is effective where there is an adequate supply of live cuttings and frequent heavy stream flows.
- Staking is also useful in conjunction with other more complex erosion control methods.
- This method should not be used if immediate stabilization is required.

Preparation

- The streambank should be cut back to a two feet horizontal to one foot vertical (2H: 1V) or flatter slope.
- The cuttings should be
 - Cut with a saw or machete, not an ax, and the side branches should be removed.
 - Between one-half to two inches in diameter.
 - Between two to three feet in length.
 - Note: Bark should not be damaged during installation.

Installation

- Try to install cuttings on same day as cut.
- Make sure the cuts are clean to avoid excess damage to the stakes.
- Live stakes should be installed during the dormant season (October–March). If the stake still has leaves, trim those and any braches close to the main stem.
- The stake should be oriented with the buds pointed up, and the bottom should be cut at an angle for easy insertion into ground.
- A dead blow hammer should be used to tamp all stakes. Stakes should be tamped into the ground perpendicular to the slope.
- About four-fifths of the length of the stake should be below ground and angled downstream. An iron bar can be used to make a pilot hole to prevent bark from being damaged during installation.
- The stakes should be randomly placed with two to four stakes per square yard.

