

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD AND SPECIFICATIONS**

**VEGETATIVE BARRIER**

(Feet)

**CODE INTERIM 601**

**DEFINITION**

Narrow, permanent strips of stiff-stemmed, erect, tall, dense perennial vegetation established in parallel rows and perpendicular to the dominant slope of the field.

**PURPOSES**

This practice may be applied as part of a conservation management system to support one or more of the following:

- \* Reduce sheet and rill erosion.
- \* Reduce ephemeral gully erosion.
- \* Manage water flow.
- \* Stabilize steep slopes.
- \* Trap sediment and sediment-borne contaminants.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to all eroding areas including but not limited to cropland, pastureland, rangeland, forestland, farmsteads, mined land, and construction sites where erosion control is needed. This practice applies only when used in conjunction with other conservation practices as part of a conservation management system.

**CRITERIA**

**General Criteria Applicable to All Purposes**

Obstructions, such as trees and debris that interfere with vegetative growth and maintenance,

will be removed to improve establishment and alignment of barriers.

Vegetative barriers shall be planted to vegetation with sufficient stem stiffness, strength, and density to trap sediment and detain runoff. The stems of the vegetation must have the ability to remain upright during runoff flow events.

Use any herbaceous species that has a proven ability to reduce flow velocity, trap sediment, and has maintained these characteristics for multiple years. Select cultivars that have superior stem strength and some resistance to common herbicides used in the crop rotation. Look for characteristics of the species such as emergence through several inches of sediment, resuming growth from buried stem nodes, rhizomatous or stoloniferous growth habit, and stems that remain erect year round.

Care will be taken to select species that allow control of invasive species. Do not select vegetation that is known to be invasive or that is a host for insect or disease pests in the locality.

Barriers may be established vegetatively or from seed. Select the method best suited for successful establishment of the barriers. Gaps between plants will be no greater than three (3) inches at the end of the first growing season.

Establish seedings according to NRCS conservation practice standard CRITICAL AREA PLANTING (342). The use of a drill or "Brillion-type" seeder will be required to meter and place seed properly. Seed will be planted in a strip at least three (3) feet wide. When the stand of vegetation is established, the barrier width may be reduced to the effective width required by the purpose but not less than two (2) feet wide.

<p>Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version, contact the Natural Resources Conservation Service.</p>
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Barriers established vegetatively will be planted at a spacing sufficiently dense to ensure a functional barrier in one growing season. While planting a continuous sod strip is best, slips or sprigs planted at a 3-inch spacing are acceptable. Establish two parallel rows of sprigs or slips not more than 2 feet apart.

In concentrated flow areas, a double row of continuous sod strips or rows planted 12 to 18 inches apart with 6 to 8-inch spacing of 4-inch diameter clumps is recommended.

Establishment by plants or by seed may be enhanced by properly installing straw bales, woven silt fences, or fiber rolls immediately upslope of the barrier location. Remove these temporary structures as soon as the vegetative barrier is established.

### **Additional Criteria to Reduce Sheet and Rill Erosion**

Erosion reduction by vegetative barriers is achieved by diverting overland flow (reduces slope length) and/or changing the cover-management condition of the soil surface. A berm must exist immediately upslope of the barrier. The minimum berm height will be three (3) inches.

Vegetative barriers are to be arranged as parallel as possible to each other on or near the contour but cross concentrated flow areas at angles convenient for farming. All tillage and planting is to be performed parallel to the vegetative barriers. This contributes to the leveling and benching between barriers.

The spacing between barriers will be determined using the lesser of a vertical interval of no more than six (6) feet or the allowable slope length that achieves soil loss tolerance using Revised Universal Soil Loss Equation (RUSLE) technology. Crop strip width will be planned in multiples of widths of planting, tillage, spraying and harvest equipment. The barrier spacing may be adjusted by up to 10 percent of the calculated spacing.

Gradients along barriers shall be no less than 0.2 percent and no greater than 1.0 percent except where the vegetative barriers cross concentrated flow areas. Gradients entering a stabilized concentrated flow area may deviate from this criteria for a distance of 100 feet not to exceed a row gradient of 1.5 percent on either side of the

concentrated flow area to allow better row alignment.

The vegetative barriers shall be a minimum of two (2) feet wide for this purpose. The barrier will be established as a minimum of two parallel rows of seeded vegetation. Sprigging is an acceptable alternative to seeding.

Vegetation shall be selected and managed to maintain a height of at least 10 inches throughout the entire year. Stem density will exceed 40 stems per square foot. Select only species that will remain erect during a runoff event.

### **Additional Criteria to Reduce Ephemeral Gully Erosion**

Separate and discrete barrier sections may be installed across concentrated flow areas to control ephemeral gully development. When used in this fashion alone, barriers do not need to extend across the ridge tops but only long enough to prevent bypass flow around the ends. Each strip must extend far enough to provide 1.5 feet of elevation above the estimated sedimentation level. Barriers installed high on the slope where the contributing drainage area is smaller will not be as long as those further down the slope.

A level base area upstream of the barrier will add stability to the vegetative barrier by dispersing runoff in high flow areas. Backwater areas dissipate energy and allow sediment deposition. Some earthmoving may be desired prior to establishing a barrier to create this level section upstream when the contributing drainage is large (over 2 acres).

The barrier should be at least three (3) feet wide and consist of two or more rows of vegetation. Establishing the barrier with sod instead of seeds will improve establishment success.

Spacing between vegetative barriers will be based on a minimum vertical interval of 1.5 feet and a maximum vertical interval of 3 feet. The barrier spacing may be adjusted by up to 10 percent of the calculated spacing. Crop strip width will be in multiples of planting, tillage, spraying, and harvest equipment.

Vegetation shall be selected and managed to maintain a height of at least 15 inches throughout the entire year. Stem density will exceed 50

stems per square foot and contain sufficient density of large stiff stems to remain erect through a runoff event.

#### **Additional Criteria to Manage Water Flow**

Barriers may be used as vegetative diversions to direct overland flow toward a stable outlet such as a grassed waterway or filter strip. These barriers will be installed across the area of overland flow and extend far enough to provide 1 foot of elevation above the estimated flow depth.

The gradient along the barrier shall be no less than 0.2 percent nor no greater than 1.0 percent except where the vegetative barrier crosses a concentrated flow area. Gradients entering a concentrated flow area may be up to 1.5 percent for 100 feet in order to achieve better row alignment.

The spacing between barriers shall not exceed a vertical interval of one (1) foot or the allowable slope length that achieves soil loss tolerance based on RUSLE technology. The barrier spacing may be adjusted by up to 10 percent of the calculated spacing. Crop strip width will be in multiples of planting, tillage, spraying, and harvest equipment.

All tillage and equipment operations in the interval between barriers will be parallel to the vegetative barrier.

A berm must exist immediately upslope of the barrier. The minimum berm height will be 3 inches.

#### **Additional Criteria to Stabilize Steep Slopes**

Barriers will be installed on the contour and spaced to provide protection to the slope. The spacing interval between barriers will be based on a maximum vertical interval not to exceed 6 feet.

#### **Additional Criteria to Trap Sediment and Sediment-borne Contaminants.**

Vegetative barriers may be used to trap sediment at the edge of fields or to compliment grassed waterways, filter strips, and field borders. Used in this manner barriers can effectively reduce sediment delivery offsite, prevent the development of headcut into the field, and ensure uniform overbank flow into streams and ditches.

Barriers work effectively at the end of furrows whether the furrows are aligned up and down the slope, across the slope, or on the contour. Vegetative barriers used in lieu of field borders to trap sediment shall be a minimum of three (3) feet wide. Barriers used to compliment existing conservation practices shall be a minimum of two (2) feet wide.

#### **CONSIDERATIONS**

The long term objectives of the land user and the sites concerns are important considerations in the selection of the proper vegetation for the barriers. Native species should be used when feasible. Wildlife enhancement and other benefits of native plants should be discussed during the planning process.

Deposition of sediment upslope of the barrier is due to the ponding of water not filtration. Barriers do not filter sediment because they have relatively large flow spaces. Sediment trapping efficiency depends on the ponded depth, backwater length, flow rate, and sediment size and density.

Vegetative barriers designed to retard and reduce runoff will be most effective on sites with gentle and uniform slopes. Continuous barriers are not desired on complex topography where a level grade cannot be maintained or where point rows will occur often.

Management practices such as crop rotations and crop residue management must be considered in designing the conservation management system on cropland. Associated structural practices such as water and sediment control basins, subsurface drainage, and underground outlets must be considered to adequately handle surface and subsurface water.

Grass species that have acceptable stem strength are switchgrass or eastern gamagrass. The growth habit and longevity of the species on the site should be considered in selecting a species for planting.

Consider the effect of tillage on the sediment that accumulates along the barrier. Tillage typically moves soil down the slope. Over time the slope will be flattened significantly. Less landscape benching will occur in no-till situations.

## Interim 601-4

### PLANS AND SPECIFICATIONS

Site specifications for establishment and maintenance of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard.

Site specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

Plans and specifications will include:

- 1) Field map with location of vegetative barriers.
- 2) Width of crop strip.
- 3) Strip orientation.
- 4) Width of barrier.
- 5) Vegetative species and cultivar.
- 6) Vegetation establishment date, rate, or spacing.
- 7) Operation and maintenance requirements.

### OPERATION AND MAINTENANCE

A vegetative erosion control practice requires continual maintenance. Maintain a healthy stand of vegetation to reduce the need for repairs to the vegetative barrier.

Immediately repair any washouts that occur. These washouts are generally narrow width and can be repaired by placing a shovel full of sod or

overfilling the damaged area and transplanting vegetation early in the spring growing season.

Barriers should be inspected after major storm events. Any gaps should be repaired immediately with sod or overfill. Timely maintenance is required to prevent further damage. Re-establish any barrier where the number of stems is not adequate to meet the purpose.

Control weeds in the barrier with spot treatments of herbicides. Use selective herbicides when available to remove unwanted plants. Pay particular attention to species that could be invasive to the cropped areas adjacent to the barrier.

As sediment accumulates upslope of the barrier, wet areas form. Install tile drainage if feasible to remove excessive wetness. Ruting or cutting to create water furrows will damage the integrity of the barrier and should be prevented.

Tall growing grasses must be mowed to minimize shading of adjacent crop rows. Mowing produces barriers of dense stems but these stems are finer. This operation is to be avoided in concentrated flow areas as larger stems are desired for erosion control.

Burning may stimulate growth of warm-season barrier grasses but is not desired in concentrated flow areas if tillage will soon follow and maximum trapping effectiveness is needed.