

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

FILTER STRIP

(Acre)
CODE 393

DEFINITION

A strip or area of herbaceous vegetation situated between cropland, hayland, grazing land, or disturbed land (including forest land) and environmentally sensitive areas.

PURPOSES

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

- Remove sediment, particulate organics, and sediment adsorbed contaminants from sheet flow runoff.
- Reduce dissolved contaminants in runoff.
- Reduce sediment, particulate organics, and sediment adsorbed contaminants in irrigation tailwater.
- Restore, create, or enhance herbaceous habitat for wildlife and beneficial insects.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies:

- 1) in areas situated below cropland, hayland, grazing land, or disturbed land where sediment, particulate organic matter and/or dissolved contaminants may leave these areas and enter environmentally sensitive areas;
- 2) in areas where permanent vegetative

establishment is needed to enhance wildlife and beneficial insects; or
3) when needed to serve as an integral component of a RIPARIAN FOREST BUFFER (391) practice (Zone 3).

CRITERIA

General Criteria Applicable to All Purposes

The filter strip shall be designed to maximize uniform sheet flow of runoff. Shaping and grading ensure sheet flow may be required. Water in concentrated flows shall be dispersed by spreading devices when necessary.

Filter strips shall be designated as vegetated areas designed to treat runoff and are not part of the adjacent cropland rotation.

Prevent erosion where filter strips outlet into streams and channels.

Filter strip establishment shall comply with local, state, and federal regulations. State or county listed noxious weeds will be controlled in the filter strip area.

Livestock grazing will not be allowed except as short duration grazing only to maintain the health and vigor of the vegetation. Adequate vegetative cover and height will be maintained in the filter strip to achieve the designated purpose.

Do not use the filter strip as a roadway.

<p>Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version, contact the Natural Resources Conservation Service.</p>

Additional Criteria to Remove Sediment, Particulate Organics, and Sediment Adsorbed Contaminants from Sheet Flow Runoff

<u>Adjacent Slope</u>	<u>Flow Length</u>
0-5 %	50 feet
5-10 %	100 feet

Use the following chart for determining minimum filter strip flow lengths for removing sediment and organics:

<u>Adjacent Slope</u>	<u>Flow Length</u>
0-5 %	25 feet
5-10 %	50 feet

Filter strip requirements:

- a) The filter strip shall be located along the downslope edge of a field or disturbed area. To the extent practical it shall be established on the approximate contour. Variation in placement on the contour should not exceed a 0.5 percent longitudinal (perpendicular to the flow length) gradient.
- b) The immediate drainage area above the filter strip shall be less than a 10 percent slope gradient.
- c) The ratio of the drainage area to the filter strip area shall be less than 50 to 1.
- d) The average annual sheet and rill erosion rate above the filter strip shall be less than 10 tons per acre per year.

The filter strip shall be established to permanent herbaceous vegetation adapted to the soil, climate, and cultural practices used in the current management system. Species selected shall have stiff stems and a high stem density near the ground surface. Stem density shall be such that the stem spacing does not exceed 1 inch.

Vigorous vegetative cover with adequate stem density will be established and/or maintained. For permanent herbaceous cover establishment, the conservation practice CRITICAL AREA PLANTING (342) shall be used.

Additional Criteria to Remove Dissolved Contaminants in Runoff

All criteria given in "Additional Criteria to Reduce Sediment, Particulate Organics, and Sediment Adsorbed Contaminants in Runoff" shall apply to this purpose also. Use the following chart to determine the minimum filter strip flow length to reduce dissolved contaminants:

Pesticides used on the field may require a specific filter flow length as indicated on product labels or state regulations. These requirements for filter flow length will be used if greater than the minimum NRCS filter strip.

Additional Criteria to Reduce Sediment, Particulate Organics, and Sediment Adsorbed Contaminants in Irrigation Tailwater

Filter strip vegetation may be small grain or other suitable annuals with a plant spacing that does not exceed 4 inches.

Annual filter strips shall be established early enough prior to the irrigation season so that the vegetation can withstand sediment deposition from the first irrigation.

The flow length shall be based on sound management objectives. The minimum flow width shall be 25 feet for this purpose.

Additional Criteria to Restore, Create, or Enhance Herbaceous Habitat for Wildlife and Beneficial Insects

This purpose may to be used in combination with one or more of the previous purposes. Additional filter strip flow length devoted to this purpose must be added to the flow length required for the primary purpose.

Any addition to the flow length for wildlife or beneficial insects may be added to either side of the filter strip based on the desired benefit. Vegetation to enhance wildlife habitat may be added to the extent this vegetation does not detract from the primary function of the filter strip. The additional filter strip area for this purpose may be established according to the CONSERVATION COVER (327) standard.

The filter strip shall not be mowed during the nesting season of the target wildlife species from May 1 to July 15. If mowing is necessary to maintain the filter strip, mow between July 15 and August 15. Livestock grazing and vehicular traffic

in the filter strip shall be excluded during this nesting period.

CONSIDERATIONS

The long term objectives of the land user and the site concerns are important considerations in the selection of the appropriate vegetative cover. Native species should be used when feasible.

Evaluate the type and quantity of pollutant, slopes and soils, groundwater depth, adapted vegetative species, time of year for proper establishment of vegetation, necessity for irrigation, visual aspects, fire hazards, and other special needs.

Filter strips should be located to reduce runoff and increase infiltration and ground water recharge throughout the watershed.

Filter strips established on slopes less than 5 percent are most effective. Filter strips may lose significant effectiveness as slope gradient increases unless the filter strip is used in conjunction with other conservation practices that reduce runoff and control sheet and rill erosion.

Consider the benefit of filter strips as required setback areas for the application of manure products.

Surface thatch buildup in a filter strip will reduce water infiltration. Discuss management options such as prescribed burning that will reduce or control thatch buildup and maintain the functionality of the filter strip.

To reduce potential damage to the filter strip vegetation, consider using vegetation that displays tolerance to herbicides used in the upslope crop rotation. Warm season grasses have shown tolerance to some of the commonly used herbicides.

Consider using this practice to enhance the conservation of declining species of wildlife including those that are threatened or endangered.

When selecting a planting mix with wildlife benefits, consider a mix containing multiple species with 60 percent or more of the species having a good to excellent wildlife rating. Species rated poor for wildlife in Table 2 of the

CONSERVATION COVER (327) standard are not recommended in a filter strip for this purpose.

Surface water runoff may be prevented from entering the filter strip during vegetative establishment through the use of temporary diversions.

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. A plan will include information about the location, construction sequence, vegetation establishment, and management and maintenance requirements.

Specifications will include:

- a) Flow length, slope, and acreage of the filter strip to accomplish the planned purpose.
- b) Species selection and planting rates (whether seeding or sprigging) to accomplish the planned purpose.
- c) Planting dates and care and handling of the seed or sprigs to ensure planted materials have an acceptable rate of survival.
- d) A statement that only viable, high quality, and adapted seed or sprigs will be used.
- e) Site preparation, fertility, and planting methods sufficient to establish the selected species.

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

OPERATION AND MAINTENANCE

For the purposes of removing sediment and filtering contaminants, permanent filter strip plantings should be harvested as appropriate to encourage dense growth, maintain an upright growth habit, and remove nutrients and other contaminants that are contained in the plant tissue.

Inspect the filter strip after storm events and repair damage. Redistribute sediment and organic materials that accumulate in the filter strip to maintain sheet flow characteristics and vegetation quality.

393-4

The development of rills and small channels within the filter areas must be prevented. Needed repairs must be made immediately to re-establish sheet flow. Devices to disperse runoff will be constructed where needed to control concentrated flow.

Vegetation must be maintained in a vigorous condition at the necessary stand density. Fertilize with commercial products as necessary to maintain the desired species composition and stand density. Timing, rate, and method of applying fertilizer must be controlled to protect environmentally sensitive areas downstream. Control undesired plant species and manage thatch buildup to achieve intended purposes.

Mowing, burning, or chemical control of undesirable weeds and woody growth is desired as long as sufficient planning and care is taken to protect the stand and water quality. Burning is allowed only with an approved plan.

Mowing shall be timed to minimize disturbance to wildlife during nesting seasons. The minimum stubble height following a mowing operation shall be 6 inches. Clipped vegetation will be removed from the filter strip to reduce thatch buildup.

Short duration grazing may be permitted when soil moisture conditions support livestock traffic without excessive compaction. The minimum grazing height will be 8 inches.

REFERENCES

Vegetative Filter Strips for Improved Surface Water Quality, 1992, Iowa State University, University Extension, Pm-1507.

Koviac, D., L. Osborn, and B. Dickson; "Effectiveness of Riparian Buffers in Reducing Pollution in the Agricultural Midwest"; 1991; Ecological Applications.

Dillaha, T., R. Reneau, S. Mostaghimi, and D. Lee; 1989; "Vegetative Filter Strips for Agricultural Nonpoint Source pollution Control"; Trans. A.S.A.E.

Schultz, J., C. Robinson, and R. Cruse; 1992; "Effectiveness of Vegetative Filter Strips"; Leopold Center Annual Report.