

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

FILTER STRIP

(Ac.)
Code 393



DEFINITION

A strip or area of herbaceous vegetation that removes contaminants from overland flow.

PURPOSE

This practice supports one or more of the following purposes (resource concerns in parenthesis):

- Reduce suspended solids and associated contaminants in runoff – (WATER QUALITY DEGRADATION – Excess nutrients in surface and ground waters, Pesticides transported to surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications, and Excessive sediment in surface waters).
- Reduce dissolved contaminant loadings in runoff –(WATER QUALITY DEGRADATION – Excess nutrients in surface and ground waters, Pesticides transported to surface and ground waters, and Excess pathogens and chemicals from manure, bio-solids or compost applications).
- Reduce suspended solids and associated contaminants in irrigation tailwater –(WATER QUALITY DEGRADATION – Excess nutrients in surface and ground waters, Pesticides transported to surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications, and Excessive sediment in surface waters).

CONDITIONS WHERE PRACTICE APPLIES

Filter strips are established where environmentally-sensitive areas need to be protected from sediment, other suspended solids, and dissolved contaminants in runoff.

CRITERIA**General Criteria Applicable to All Purposes**

Filter strip establishment must comply with local, state, and Federal regulations.

Avoid or minimize to the extent practical impact to cultural resources, wetlands, and Federal and State protected species during planning, design and implementation of this conservation practice. For more information, see National and Florida NRCS policy, [General Manual \(GM\) Title 420-Part 401, Title 450-Part 401, and Title 190-Parts 410.22 and 410.26](#); National Planning Procedures Handbook (NPPH, [Handbooks Title 180 Part 600](#)) FL Supplements to Parts 600.1 and 600.6; National Cultural Resources Procedures Handbook (NCRPH, [Handbooks Title 190 Part 601](#)); and The National Environmental Compliance Handbook (NECH, [Handbooks Title 180 Part 610](#)).

Overland flow entering the filter strip needs to be uniform sheet flow. Any concentrated flow must be dispersed before it enters the filter strip.

The gradient along the leading edge of the filter strip cannot exceed one-half of the up-and-down hill slope percent, immediately upslope from the filter strip, up to a maximum of 5%.

Do not plant any species found on the Florida Department of Agriculture and Consumer Services or the Florida Department of Environmental Protection noxious or prohibited weed lists. Additionally, do not use any Category 1 species identified by the Florida Exotic Pest Plant Council, (<http://www.fleppc.org/list/list.htm>).

Filter strips cannot be used as a travel lane for equipment or livestock.

Additional Criteria to Reduce Suspended Solids and Associated Contaminants in Runoff

Design the filter strip to have a 10-year life span, following the procedure in the [Agronomy Technical Note No. 2 "Using RUSLE2 for the Design and Predicted Effectiveness of Vegetative Filter Strips \(VFS\) for Sediment"](#), based the sediment delivery to the upper edge of the filter strip in RUSLE2 and ratio of the filter strip flow length to the length of the flow path from the contributing area. Twenty feet is the minimum flow length through the filter strip. Locate the filter strip immediately downslope from the source area of contaminants.

The slope of the drainage area above the filter strip needs to be 1% or greater.

Vegetation. Only perennial herbaceous vegetation can be used in a filter strip

Species used need to be:

- Able to withstand partial burial from sediment deposition,
- Tolerant of herbicides used on the area that contributes runoff to the filter strip, and
- Have stiff stems and a high stem density near the ground surface.

Only use species suited to current site conditions and intended uses. See Florida Conservation Practice Standard [Forage and Biomass Planting, Code 512](#), and accompanying [guidance](#) for recommended species. Additionally, selected species need to have the capacity to achieve adequate density and vigor within an appropriate period to stabilize the site sufficiently to permit suited uses with ordinary management activities.

Each application needs to have species, seeding or planting rate, minimum quality of planting stock (e.g., pure live seed, etc.) and method of establishment specified. Use only viable, high quality seed or planting stock. Consult the [Florida Plant List for Conservation Alternatives \[FOTG II \(G\)\]](#) for species that can be selected for this practice.

The minimum seeding/planting rate and resulting stem density needs to be equivalent to a high quality grass hay seeding/planting rate for the climate area or the density of vegetation selected in RUSLE2 to determine trapping efficiency, whichever is the higher seeding rate.

Select site preparation and seeding or planting time and manner that best ensure survival and growth of the selected species. Specify what constitutes successful establishment, (e.g., minimum percent ground/canopy cover, percent survival, stand density, etc.) in the implementation requirements.

Additional Criteria to Reduce Dissolved Contaminants in Runoff

All the criteria given in the previous section also apply to this purpose. Additionally, for this purpose, the minimum flow length needs to be 30 feet.

Additional Criteria to Reduce Suspended Solids and Associated Contaminants in Irrigation Tailwater

A small grain or other suitable annual plant can be used for filter strip vegetation for this purpose. Use a seeding rate that will ensure 16 to 18 plants per square foot. See Florida Conservation Practice Standard [Forage and Biomass Planting, Code 512](#), and accompanying [guidance](#) for more information.

Establish filter strips early enough prior to the irrigation season so that the vegetation is mature enough to filter sediment from the first irrigation.

The minimum flow length for this purpose is 20 feet.

CONSIDERATIONS

General. Filter strip width (flow length) can be increased as necessary to accommodate harvest and maintenance equipment.

Filter strips with the leading edge on the contour will function better than those with a gradient along the leading edge.

Seeding/planting rates that establish a higher stem density than the normal density for a high quality grass hay crop will be more effective in trapping and treating contaminants.

Reducing Suspended Solids and Associated Contaminants in Runoff.

Increasing the width of the filter strip beyond the minimum required will increase the potential for capturing contaminants in runoff.

Creating, Restoring or Enhancing Herbaceous Habitat for Wildlife and Beneficial Insects and Pollinators.

Filter strips are often the only break in the monotony of intensively cropped areas. The wildlife and pollinator benefits of this herbaceous cover can be enhanced by:

- Where site appropriate, use native grass species that fulfill the purposes of the practice while also providing habitat for priority wildlife.
- Adding native forbs to the filter strip seeding mix that are beneficial to wildlife and pollinators (see [Plant Materials Fact Sheet No. 4 – Developing Planting Mixtures for Pollinator Habitat](#)) and be compatible for one of the listed purposes. Changing the seeding mix should not detract from the purpose for which the filter strip was established.
- Increasing the width beyond the minimum required. This additional area can increase food and cover for wildlife and pollinators.
- Management activities on filter strips, such as mowing, burning, or light disking, should not be done more often than every other year with frequency dependent on geographical location to maintain the purposes of the practice.
- Management activities on the filter strip should be completed outside of the primary nesting, fawning, and calving seasons. Activities should be timed to allow for regrowth before the growing season ends whenever possible.
- Organic producers may have to submit plans and specifications to their certifying agent for approval prior to installation, as part of the organic producer's Organic System Plan

Maintain or Enhance Watershed Functions and Values.

Filter strips can:

- enhance connectivity of corridors and non-cultivated patches of vegetation within the watershed;
- enhance the aesthetics of a watershed; and
- be strategically located to reduce runoff, and increase infiltration and ground water recharge throughout the watershed.

Increase Carbon Storage.

Increasing the width of a filter strip beyond the minimum required will increase the potential for carbon sequestration.

PLANS AND SPECIFICATIONS

Plans and specifications need to be prepared for each specific field site where a filter strip will be installed. Record practice specifications on the Filter Strip Implementation Requirement document. A plan includes information about the location, construction sequence, vegetation establishment, and management and maintenance requirements.

As a minimum, the plans shall include:

- Length, width (width refers to flow length through the filter strip), and slope of the filter strip to accomplish the planned purpose.
- Species selection and seeding or sprigging rates to accomplish the planned purpose.
- Planting dates, care and handling of the seed to ensure that planted materials have an acceptable rate of survival.
- A statement that only viable, high quality and regionally adapted seed will be used.
- Site preparation instructions sufficient to establish and grow selected species.

OPERATION AND MAINTENANCE

For the purposes of filtering contaminants, permanent filter strip vegetative 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.

Control undesired weed species, especially state-listed noxious weeds.

Prescribed burning may be used to manage and maintain the filter strip when an approved burn plan has been developed in accordance with Florida NRCS Conservation Practice Standard [Prescribed Burning, Code 338](#).

Inspect the filter strip after storm events and repair any gullies that have formed, remove unevenly deposited sediment accumulation that will disrupt sheet flow, reseed disturbed areas, and take other measures to prevent concentrated flow through the filter strip.

Apply supplemental nutrients as needed to maintain the desired species composition and stand density of the filter strip. Nutrients shall be applied in accordance with Florida NRCS Conservation Practice Standard [Nutrient Management, Code 590](#).

Periodically re-grade and re-establish the filter strip area when sediment deposition at the filter strip-field interface jeopardizes its function. Reestablish the filter strip vegetation in these regarded areas, if needed.

If grazing is used to harvest vegetation from the filter strip, the grazing plan must insure that the integrity and function of the filter strip is not adversely affected. See Florida NRCS Conservation Practice Standard [Prescribed Grazing, Code 528](#), for further guidance.

REFERENCES

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- Revised Universal Soil Loss Equation Version 2 (RUSLE2) website (checked May 2007):
http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm.
- Sources of Organic and Untreated Non-GMO Seeds. National Sustainable Agriculture Information Service. <http://attra.ncat.org/sorg/seeds.html>
- USDA-AMS National Organic Program National List of Allowed and Prohibited Substances.
<http://www.ams.usda.gov/AMSV1.0/nop>
- USDA-AMS National Organic Program Regulations, 7 CFR Part 205.
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