

**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:

- Reduce suspended solids and associated contaminants in runoff.
(Resource concerns: 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.
(Resource concerns: 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.
(Resource concerns: 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

Ensure that only uniform sheet flow enters the filter strip by dispersing any concentrated flow.

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

Do not establish state-listed noxious or invasive plants.

Do not use filter strips 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). The minimum flow length through the filter strip is 20 feet.

Locate the filter strip immediately downslope from the source of contaminants.

The slope of the area above the filter strip should be 1% or greater.

Vegetation. Establish perennial vegetation that is able to withstand partial burial from sediment deposition, and tolerant of herbicides used on the area that contributes runoff to the filter strip.

Select species that have stiff stems and a high stem density near the ground surface.

Selected species must be suited to current site conditions and intended uses, and become

well established quickly enough to stabilize the site and provide filtering function.

Specify species, rates of seeding or planting, minimum quality of planting stock, such as PLS or stem caliper, and method of establishment before application. Use only viable, high quality seed or planting stock.

Do site preparation and seeding or planting at a time and in a manner that best ensures survival and growth of the selected species.

Plant when soil moisture is adequate for establishment.

Specify successful establishment criteria (e.g. minimum percent ground/canopy cover, percent survival, stand density, etc.) before application. The established strip should have a plant stem density that adequately filters contaminants from the highest expected flows. As a point of reference, consider the stem density of a well-established, high-quality grass hay crop.

Additional Criteria to Reduce Dissolved Contaminants in Runoff

The criteria given in “**Additional criteria to reduce suspended solids and associated contaminants in runoff**” for location, drainage area and vegetation characteristics also apply to this purpose.

The minimum flow length for this purpose is 30 feet.

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

Seed small grain or other suitable annuals at a rate that results in a minimum of 16 plants per square foot.

Plant the strip early enough so that the vegetation is well established prior to the first irrigation.

CONSIDERATIONS

General

High runoff volume often results from low water infiltration rates associated with poor soil health and structure. To reduce the need for the filter strip, incorporate soil health improving practices such as cover crop and reduced tillage that leaves at least 60% residue cover.

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

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

Seeding 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.

If needed, invasive plant species may be controlled through mowing, herbicides and hand weeding based on the land users situation.

Considerations for 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.

Considerations for 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 herbaceous plant species including native forbs to the filter strip seeding mix that are beneficial to wildlife and pollinators 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 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

Considerations to 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.
- 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

Prepare and record plans and specifications for each field site where a filter strip will be installed.

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

As a minimum, they should 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 filtering contaminants, harvest the filter strip 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.

If prescribed burning is used to manage and maintain the filter strip, an approved burn plan must be developed.

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.

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

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 jeopardized.

Organic producers may have to maintain records for five years as part of their Organic System Plan.

REFERENCES

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