

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

FILTER STRIP

NEW YORK

(Ac.)

CODE 393

DEFINITION

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

PURPOSE

- To reduce sediment, particulate organics, and sediment adsorbed contaminant loadings in runoff.
- To reduce dissolved contaminant loadings in runoff.
- To serve as Zone 3 of a Riparian Forest Buffer, Practice Standard 391.
- To reduce sediment, particulate organics, and sediment adsorbed contaminant loadings in surface irrigation tailwater.
- To restore, create or enhance herbaceous habitat for wildlife and beneficial insects.
- To maintain or enhance watershed functions and values.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies:

- (1) in areas situated below cropland, grazing land, or disturbed land (including forest land)
- (2) where sediment, particulate matter and/or dissolved contaminants may leave these areas and are entering environmentally sensitive areas;
- (3) in areas where permanent vegetative establishment is needed to enhance wildlife and beneficial insects, or maintain or enhance watershed function.

This practice applies when planned as part of a conservation management system.

CRITERIA

General Criteria Applicable to All Purposes

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

Overland flow entering the filter strip shall be primarily sheet flow. Concentrated flow shall be dispersed.

State listed noxious weeds will not be established in the filter strip and will be controlled if present.

Filter strip establishment shall comply with local, state and federal regulations.

Additional criteria to reduce sediment, particulate organics and sediment-adsorbed contaminant loadings in runoff

Filter strip flow length shall be determined based on field slope percent and length, and filter strip slope percent, erosion rate, amount and particle size distribution of sediment delivered to the filter strip, density and height of the filter strip vegetation, and runoff volume associated with erosion producing events. The minimum flow length for this purpose shall be 20 feet.

Filter strip location requirements:

- The filter strip shall be located along the downslope edge of a field or disturbed area. To the extent practical it shall be placed on the approximate contour. Variation in placement on the contour

should not exceed a 0.5% longitudinal (perpendicular to the flow length) gradient.

- The drainage area above the filter strip shall have greater than 1% but less than 10% slopes.
- The flow length (filter strip width) shall be at least 20 feet for slopes of less than 1 (one) percent and increased 1.5 (one and one-half) feet of flow length for each percent of slope increase. The maximum effective GFS length of flow is 100 feet. The maximum length of slope above a Grass Filter Strip will be 400 feet on cropland and 700 feet on pasture.

Siting: The GFS shall be placed where vigorous dense vegetation exists or can be established.

Vegetation

Existing Vegetation:

- Site will have healthy existing vegetation with uniform cover consisting of a permanent herbaceous vegetative cover with a single species or a mixture of grasses, legumes, and/or other forbs adapted to the soil, climate, nutrients, chemicals, and practices used in the current management system.
- pH shall be maintained at a minimum of 6.2.
- P and K will be in the medium range (Cornell Nutrient Analysis Lab).
- Interseed as needed.

Establishing New Vegetation:

Seedbed Preparation: Apply lime to a pH of 6.2 prior to topsoiling. Fertilize as needed to insure rapid, healthy plant growth. Initial establishment conditions should have the pH adjusted to 6.2 and P and K in the medium range (Cornell Nutrient Analysis Lab).

Mix lime and fertilizer into the soil. Finish seedbed like a lawn with a smooth rolled surface to allow for easy maintenance.

Seeding: Seed, in accordance with Table 1, to obtain a uniform solid stand of vegetation .

TABLE 1

	Species	lbs./ac.	lbs./ 1000 sq. ft.
Well drained soils, dry conditions			
1.	Tall fescue	20	(0.5)
	Orchardgrass	10	(0.25)
	Perennial ryegrass	5	(0.1)
	or Redtop	2	(0.1)
2.	Orchardgrass	10	(0.25)
	Timothy	10	(0.25)
	Perennial ryegrass	5	(0.1)
Less than well drained soils, wet conditions			
3.	Tall fescue	30	(0.75)
	Perennial ryegrass	5	(0.1)
	or Redtop	2	(0.1)

Late August or early September seedings are best. Early spring seedings are very satisfactory. Do not seed between June 15 to August 15. Mulch the seeding with 2 ton/acre (90 lb./1000 square feet) of small grain straw to avoid rilling during establishment. Anchor mulch as necessary.

Maintenance:

Foliage should be removed at least once each growing season to maintain dense upright vegetative growth habit. The timing of the mowing shall be considered based on the vegetative stage of the filter strip and the actual weather conditions to keep the grass in a vegetative state or mostly leafy condition. If wildlife habitat is a consideration for the filter strip, mowing shall be timed to minimize disturbance to wildlife during nesting season. Cut to a height of 3 – 5 inches and remove the top growth. Avoid driving over the filters if soil moisture conditions will result in vehicle ruts.

Grazing: Livestock will be excluded from the GFS. Occasional controlled grazing may be satisfactory when the filter strip is dry and firm. Stubble height will be maintained at 3 inches to 5 inches high or more.

Additional Criteria to Reduce Dissolved Contaminants in Runoff

The criteria given in “Additional criteria to reduce sediment, particulate organics and sediment adsorbed contaminant loadings in runoff” also apply to this purpose.

Filter strip flow length required to reduce dissolved contaminants in runoff shall be based on management objectives, contaminants of concern, and the volume of runoff from the filter strip’s drainage area compared with the filter strip’s area and infiltration capacity.

The flow length determined for this purpose shall be in addition to the flow length determined for reducing sediment, particulate organics and sediment-adsorbed contaminant loadings in runoff.

The minimum flow length for this purpose shall be 30 feet.

Additional Criteria to Serve as Zone 3 of a Riparian Forest Buffer, Practice Code 391

Except for the location requirements, the criteria given in “**Additional criteria to reduce sediment, particulate organics and sediment adsorbed contaminant loadings in runoff**” also apply to this purpose.

If concentrated flows entering Zone 3 are greater than the filter strip’s ability to disperse them, other means of dispersal, such as spreading devices, must be incorporated.

Additional Criteria to Reduce Sediment, Particulate Organics and Sediment-adsorbed Contaminant Loadings in Surface Irrigation Tailwater

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

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 management objectives.

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

If this purpose is intended in combination with one or more of the previous purposes, then the minimum criteria for the previous purpose(s) must be met.

Additional filter strip flow length devoted to this purpose must be added to the length required for the other purpose(s).

Any addition to the flow length for wildlife or beneficial insects shall be added to the downhill slope of the filter strip.

Vegetation to enhance wildlife may be added to that portion of the filter strip devoted to other purposes to the extent they do not detract from its primary functions.

Plant species selected for this purpose shall be for permanent vegetation adapted to the wildlife or beneficial insect population(s) targeted.

If this is the only purpose, filter strip width and length shall be based on requirements of the targeted wildlife or insects. Density of the vegetative stand established for this purpose shall consider targeted wildlife habitat requirements and encourage plant diversity. Dispersed woody vegetation may be used to the extent it does not interfere with herbaceous vegetative growth, or operation and maintenance of the filter strip.

The filter strip shall not be mowed during the nesting season of the target wildlife.

Livestock and vehicular traffic in the filter strip shall be excluded during the nesting season of the target species.

Additional Criteria to Maintain or Enhance Watershed Functions and Values

Filter strips shall be strategically located to enhance connectivity of corridors and non-cultivated patches of vegetation within the watershed.

Filter strips shall be strategically located to enhance aesthetics of the watershed.

Plant species selected for this purpose shall be for establishment of permanent vegetation.

CONSIDERATIONS

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

Filter strips for the single purposes of wildlife/beneficial insect habitat or to enhance watershed function should be strategically located to intercept contaminants thereby enhancing air and water quality.

To avoid damage to the filter strip consider using vegetation that is somewhat tolerant to herbicides used in the up-slope crop rotation.

Increasing the width of the filter strip will increase the potential for capturing particulates.

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

Consider using this practice to protect National Register listed or eligible (significant) archaeological and traditional cultural properties from potential damaging contaminants.

Filter strip size should be adjusted to a greater flow length to accommodate harvest and maintenance equipment.

Select grass species that sequester more carbon.

Increasing the width of filter strip will increase the potential for carbon sequestration.

PLANS AND SPECIFICATIONS

Based on this standard, plans and specifications shall be prepared for each specific 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.

Specifications shall include:

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

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.

To maintain or restore the filter strip's function, periodically regrade the filter strip area when sediment deposition at the filter strip-field interface jeopardizes its function, and then reestablish the filter strip vegetation, if needed. If wildlife habitat is a purpose, destruction of vegetation within the portion of the strip devoted to that purpose should be minimized by regrading only to the extent needed to remove sediment and fill concentrated flow areas

REFERENCES

A Guide to Conservation Plantings on Critical Areas for New York. Gaffney, F.B., et. al., USDA- Soil Conservation Service, Syracuse, New York, 1991.

Nutrient and Sediment Control System for the Treatment of Cropland Runoff. USDA-NRCS, NNTC, Water Quality Technical Note, Chester, PA, September 1995.

Lysimeter Studies. USDA-NRCS Big Flats PMC, 1995. (Unpublished).

Grassed Filter Strips Can Reduce Losses of Nitrogen and Phosphorus in Runoff. Edwards, D.R., P.A. Moore and T.C. Daniel, Better Crops, Volume 80, Number 4, 1996.

Water Quality Impacts of Vegetated Filter Strips. Dillaha, T.A., Paper Number 89-2043, Summer meeting of American Society of Agricultural Engineers, June 1989.