

NATURAL RESOURCES CONSERVATION SERVICE
 CONSERVATION PRACTICE STANDARD
FILTER STRIP - STRIP
New York
 (acre)
 code 393s

DEFINITION

A strip or area of vegetation for removing sediment, organic matter, nutrients and other pollutants from runoff and waste water.

PURPOSE

To remove sediment, organic matter and other pollutants from runoff or waste water by filtration, deposition, infiltration, absorption, adsorption, decomposition, and volatilization, thereby reducing pollution and protecting the environment.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to treat sheet overland flow on cropland and pasture at the lower edge of fields; or above conservation practices such as terraces or diversions; or on fields adjacent to streams, ponds, and lakes.

CRITERIA

General:

A Grass Filter Strip (GFS) is typically configured as a strip adjacent to the field to treat overland sheet flow by settling and some infiltration. Grass Filter Strips do not treat concentrated flows.

A GFS is an excellent method for reducing the total solids, sediment, biochemical oxygen demand (BOD) and total phosphorus. The filtering and deposition processes have been shown in a variety of situations. Organic solids will decompose biologically on the filter. Once settled out on a filter, the BOD concerns will be met in an aerobic environment with the organic matter reduced to humus. Ammonia volatilization, and denitrification of nitrates occurs. Phosphorus will be fixed to soil particles and organic matter. Where control of pathogens and soluble substances such as ammonia, nitrates, and phosphorus is desirable, infiltration will need to occur before significant reduction in pollutant flows can be expected. Each specific site will need to be evaluated to

determine if a GFS will meet the objectives in reducing the pollutants that are of concern

Water management and erosion and sediment control shall be considered for all applications of grass filters. Reducing the total volume and the concentrations of pollutants will increase the effectiveness of the GFS.

Length of Flow: The GFS will be designed to provide sheet overland flow through vigorous dense vegetation. The leading (uphill) edge shall be on the contour or provisions must be made to disperse any concentrated flows.

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.
- 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	20	(0.5)
	Reed canarygrass	10	(0.25)
	Redtop	2	(0.1)
4.	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, three times each growing season. Mow when seed heads first appear to keep the grass in a vegetative state or mostly leafy condition. 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 GFA. Occasional controlled grazing may be

satisfactory when the filter area is dry and firm. Stubble height will be maintained at 3 inches to 5 inches high or more.

CONSIDERATIONS

Evaluate type and quantity of pollutant, slopes and soils, adapted vegetative species, time of year for proper establishment of vegetation, necessity for irrigation, visual aspects, fire hazards, and other special needs. Prevent erosion where filters outlet into streams or channels.

OPERATION AND MAINTENANCE

Maintain sheet flow entering the GFS. Repair all rills and small channels within the Grass Filter Strip. Needed repairs must be made immediately to reestablish sheet flow onto and through the Grass Filter Strip. Vegetation must be maintained in a vigorous condition. Maintain fencing as needed. If phosphorous is a concern, periodically test soil to monitor phosphorous build-up.

PLANS AND SPECIFICATIONS

Plans and specifications for Grass Filter Strips shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. The completed work is to be checked and documented to verify that this practice was completed according to the drawings, specifications, and this standard.

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.