

# AGRICULTURAL GUIDE

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Soil and Water

## Maintaining grassed waterways

Don Pfost, Department of Agricultural Engineering,  
College of Agriculture  
Larry Caldwell, USDA, Soil Conservation Service,  
Columbia, Missouri

Grassed waterways are commonly used to prevent gullies, where water flowing down a hillside concentrates, or as an outlet for water from terraces. Inspect grassed waterways annually or after unusually large storms. Perform needed maintenance promptly to prevent costly damage to the waterway.

**Common waterway maintenance problems.** Common maintenance problems with grassed waterways include insufficient grass, gullies, sedimentation, insufficient capacity, weeds and brush.

### Insufficient grass

Insufficient grass may be caused by establishment problems, low soil fertility, smothering from lodged growth, accumulated sediment, and competition from weeds, legumes and nearby trees or brush. This problem may also be caused by not turning off the herbicide sprayer when crossing waterways, from herbicide runoff, or from herbicide-laden sediment deposits.

It is difficult to re-establish grass in a functioning waterway because of periodic flowing water. Bare spots may be re-seeded or sodded. Mulching can help to re-establish a grass seeding. Bare spots being reseeded should not be lower than the surrounding channel areas. You may slightly overfill them to divert water while grass becomes established.

Periodic soil tests make a proper soil fertility maintenance program for waterways easier. Waterways can be top-dressed with lime, fertilizer or manure. In extreme cases, a waterway may require a major renovation. In these cases, low fertility may be corrected by moving in topsoil and/or mixing in lime, fertilizer, manure or organic matter to obtain the desired fertility level. For more details, refer to Guide 4805, "Establishing and Maintaining Vegetation on Critical Areas."



Grassed waterways can provide a stable outlet for terraces or prevent a gully where hillside runoff water concentrates.



Livestock or machine travel up and down waterways may cause gully erosion problems.

### Weeds and brush control

A high fertility program and heavy nitrogen fertilization helps grass to compete with weeds and legumes and to maintain a vigorous stand. Control trees and brush by cutting and/or with herbicides. Contact your local extension center for recommendations on control herbicides.

To prevent smothering from lodged, accumulated growth, mow and remove hay from the waterway as required to maintain a moderate height. If hay is not desirable, more frequent mowing and/or shredding can prevent smothering without removing the residue.



Brush and trees should not be allowed to compete with grass in the waterway. This unstable outlet may require regrading or a grade stabilization structure to eliminate erosion at the lower end of the waterway.



Conservation tillage that leaves 30 percent or more of the field surface covered with crop residue will drastically reduce sedimentation in waterways (and terraces).

Delay mowing until after July 15 of each year to avoid destruction of wildlife.

Some waterways may not be accessible during the normal cropping/haying season. Growth may be removed at other seasons, if necessary. Hay quality may be sacrificed for convenience. Carefully controlled grazing may be permissible when the ground is not too wet or too dry.

## Gullies

Gullies may be caused by original construction irregularities, by sediment deposits, by using the waterway as a travelway, or by livestock paths, and by unstable outlets. (Unstable outlets result from a drop-off or an extremely steep slope at the lower end of the waterway.)

To control unstable outlets, regrade (and re-seed) the outlet end or construct a grade stabilization structure. For more details, refer to Guide 1509, "Types of Stabilization Structures."

Gullies must be filled and reseeded or sodded. Fill material should be well compacted. Slight overfilling may be desirable to allow for settling and to divert water flow somewhat while the new grass becomes established.

Sediment deposits should be removed before grass is damaged, if possible.

Machine travel up and down waterways should be minimal, especially when wet and soft. Machine travel on waterways will be required during haying and other maintenance operations, and, except for waterways located on the field boundary, will usually be crossed or used as a turn-strip for normal field machinery operations.

Livestock may have to be fenced out of waterways when they are grazing fields.

After grass is well established, remove temporary dikes (berms) built to prevent runoff from entering waterways

during the grass establishment period. The objective is to allow runoff to enter the waterway and prevent water from eroding a channel along the side of the waterway. Soil removed from the berms may be used to fill low spots in the field or to build terrace ridges.

## Insufficient capacity

Insufficient waterway capacity may result from sediment accumulation in the channel or from loss of side berm (dike) height. (Permanent side berms are commonly used to contain the water flow in shallow waterways located on field boundaries or ridges.)

Higher residue tillage systems or more soil-conserving crop rotations can reduce sediment buildup.

Overflow can cause a gully to form along the side of the waterway. Sediment buildup in the waterway can cause water to pond in the lower end of the terrace channel.

In severe cases, sediment must be removed from the channel, and the channel re-seeded. In other cases, the height of the side dikes (for waterways not in natural drainageways) may be increased and the dikes re-seeded.

Spot removal of sediment from the waterway at the terrace discharge may eliminate ponding in the terrace channel with a minimum of waterway re-seeding required. In other cases, the lower end of the terrace may be moved downhill to access the waterway at a lower point to obtain adequate terrace channel drainage.

If the waterway has to be rebuilt or reseeded, water from the terraces may have to be diverted outside of the waterway until the grass is established. Small, temporary cross trenches and dikes with a fall of 6 to 12 inches across the waterway to interrupt the flow of water on long waterways may be useful in establishing grass.



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