
Pasture Water Quality: Sediment

Why is reduction of soil loss important?

Top soil, the source of most soil loss, is the part of the soil profile that has the greatest water and nutrient holding capacity. Loss of this part of the soil profile has the potential to reduce forage and crop production. Sediment usually refers to soil when it becomes dislodged and is carried by wind or water and is deposited. Sediment in water reduces its usefulness for industrial, recreational, and domestic needs (e.g. drinking water). The sediment has to be removed, and this can be costly, before it can be used for these needs. When sediment is deposited in ponds and reservoirs, it reduces their usefulness unless major remedial efforts are made.

What are some of the factors that contribute to soil loss?

Factors that contribute to surface runoff also contribute to soil loss, and some of them are:

- Slope – the steeper the slope, the greater is the potential for runoff and soil loss
- Slope length – longer slopes have greater potential for the momentum of runoff to build and channelize, thus removing more soil
- Vegetative cover – runoff and soil loss decreases with increasing vegetative cover
- Rainfall intensity – the potential for runoff and soil loss increases with increasing rainfall intensity

- Antecedent soil moisture – wet soil holds less additional water and contributes to greater runoff and soil loss
- Compaction/infiltration – compacted or crusted soil allows less infiltration and more runoff

Is there soil loss from pastures?

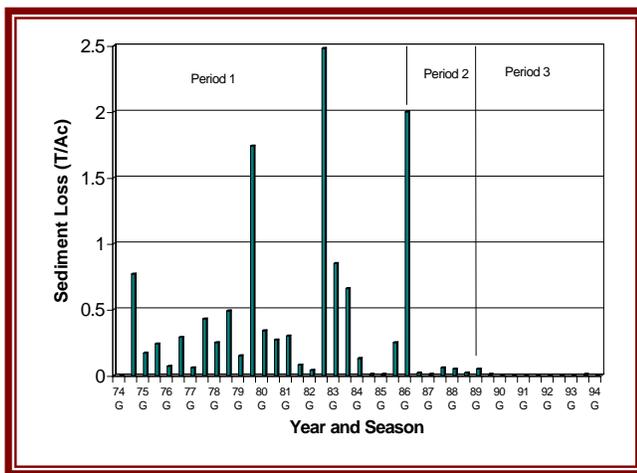
With good management, very little soil loss occurs from pastures. But practices that adversely contribute to the above factors may produce pastures that lose soil. For example, overgrazing reduces vegetative cover and may increase soil compaction. Too many animals on too few acres during the winter will reduce plant cover and may cause compaction below the surface while keeping the soil surface “churned” and loose, ready to move in runoff.



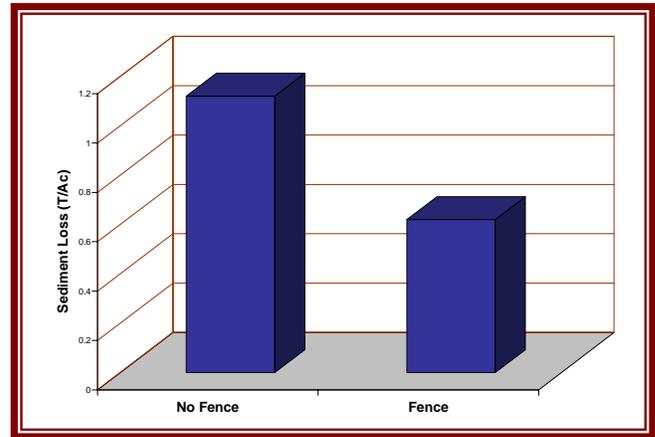
Runoff and soil loss from a constant-occupancy winter-feeding area

What are some practices that reduce soil loss from pastures?

- Do not overgraze pastures – Even unimproved pastures, i.e. no added fertilizer or no rotational grazing, have very little soil loss if they are not overgrazed.
- Fence streams away from livestock – Fencing streams so that livestock have no or only limited access can reduce the sediment carried by the stream. Properly constructed stream crossings also help protect the stream. Most of this reduction may occur from reducing cutting and degradation of the stream bank by livestock instead of reducing the movement of soil over the pasture surface.
- Use at least limited rotation of herd in winter – Avoid keeping livestock in the same field or paddock for the entire winter. Splitting the winter feeding period among 3 or 4 (or more) fields will reduce a lot of damage to the vegetative cover, churning of the surface soil, and soil compaction.



Period 1: Rotational summer grazing with hay brought in for winter grazing; Period 2: Rotational summer grazing; Period 3: Hay production.



Sediment loss from an unimproved pasture where cattle had access to the stream and the same pasture with the cattle fenced out of the stream.

Summary

Pasture systems are good systems for controlling soil loss and sediment entering streams, ponds, reservoirs, etc. Pastures that are not overgrazed, either unimproved or improved, will be within soil loss tolerance limits.

Practices that will help reduce or prevent the potential for soil loss are:

- Fencing streams away from livestock
- Using limited rotation of a herd during winter feeding as contrasted with constant occupancy in a small pasture

(Information based on research conducted at the North Appalachian Experimental Watershed near Coshocton, Ohio. The NAEW is a USDA-Agricultural Research Service location working in cooperation with the OSU/OARDC. NAEW, USDA-ARS, P.O. Box 488, Coshocton, Ohio 43812)

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