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How to Control Sheet and Rill Erosion
Michigan State University
Cooperative Extension Service
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How to Control Sheet and Rill Erosion

Controlling sheet and rill erosion is an effective way to reduce non-point source pollution from farmland.

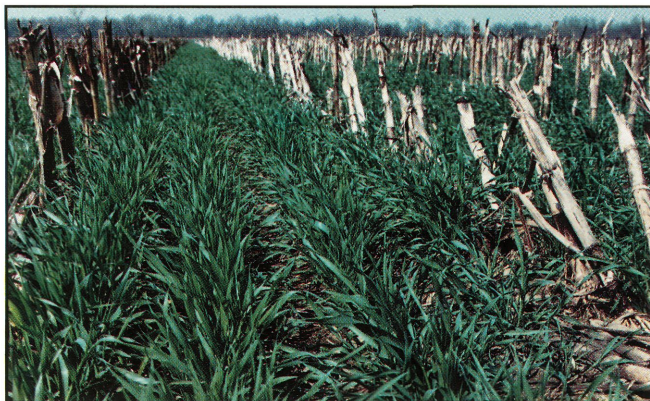


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Cover Crops

Cover crops are close-grown crops like rye, alfalfa, or clover planted and grown to protect the soil from erosion when other crops do not provide adequate cover. Cover crops provide the cover needed during critical winter and spring seasons in fields with little or no crop residue on the surface after harvest.



Cover crops may be aerial-seeded into growing crops or planted after crops have been harvested. Cover crops are compatible with nearly all combinations of conservation practices.



Contour Farming

Contour farming is conducting all field operations -- planting, cultivating and harvesting -- on the contour or parallel to an imaginary level line plotted across the slope. When field operations are on the contour, ridges created by plant rows and tillage implements form miniature dams that hold rainwater and reduce runoff.



Terraces

A terrace is a ridge, or a combination of a ridge and channel, constructed across a slope. Terraces divide long slopes into two or more units. They lower erosion hazards by intercepting and diverting runoff to grassed waterways or underground drains.

Terraces need the support of contour farming and other conservation practices to be effective. Terraces, contour farming and conservation tillage will usually control erosion on gently sloping land.

The assistance of a soil conservationist is often needed to establish the initial or base contour line, or to install terraces.

Conservation Tillage

Conservation tillage is a tillage system that leaves enough residue from the previous crop on the surface to reduce runoff and erosion.

Conservation tillage is an effective erosion control practice because crop residues on the surface insulate the soil from the impact of rain drops. Crop residues on the surface also create tiny dams that trap and hold runoff water.



No-till is the most effective form of conservation tillage because crop residues remain on the surface during the planting and growing seasons.



Cropping Sequence

Crops grown in a recurring sequence on the same land influence the amount of sheet and rill erosion that occurs. The erosion hazard is greatest when the field is used to grow crops like corn, but is greatly reduced when the field is used to produce hay or similar close-grown crops.

The years of row, grain, and hay crops needed in a conservation cropping sequence, which keep the average annual erosion rate at or below the tolerable rate, are determined by the erosion hazard. Row crops may be grown more frequently in fields with moderate erosion hazards, but several years of hay or similar crops are needed in fields with severe erosion hazards. A conservation cropping sequence (rotation) is usually used with one or more other conservation practices.



In addition to reducing erosion, conservation cropping sequences break up the life cycles of several insects and crop diseases and provide food and cover for wildlife.

Sheet and Rill Erosion

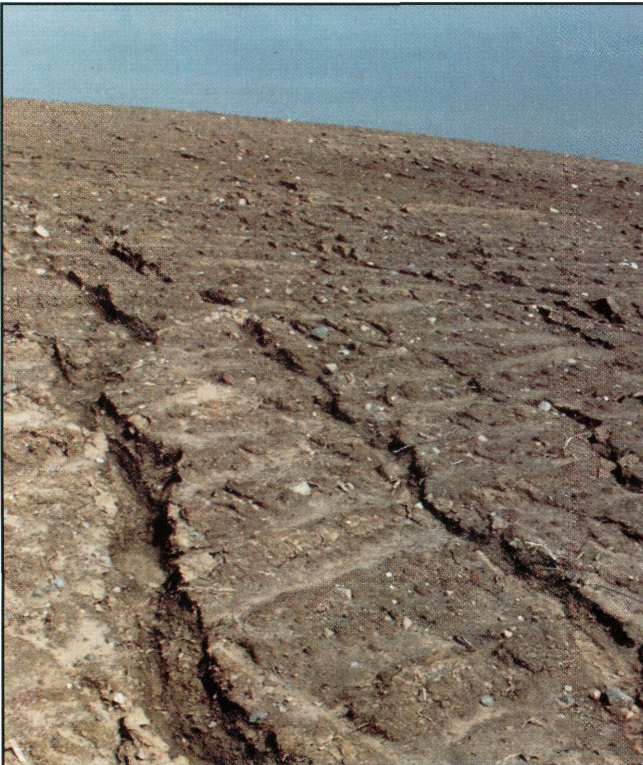
Sheet erosion is removal of a thin layer of soil from the surface of the land. Soil particles are loosened by the impact of falling raindrops and carried from the site by the thin overland flow of runoff water.

Rill erosion is removal of soil from the sides and bottoms of small channels formed where surface runoff becomes concentrated and forms tiny streams.

Sheet erosion and rill erosion usually occur together and are usually referred to as a combination: sheet and rill erosion.

Sheet and rill erosion are the most damaging forms of erosion. They are also the most common and widespread forms of soil erosion. According to a recent study by the Soil Conservation Service, these two forms of erosion cause 35 million tons of erosion on Michigan cropland each year.

Rill erosion



Because sheet and rill erosion can occur each time there is enough rain to cause runoff from unprotected fields, all cropland is subject to damage by these forms of water erosion. The damage, however, is so uniform that it is often overlooked until the cumulative damage of many erosion events begins to reduce plant growth and crop yields.

The amount of sheet and rill erosion that occurs is determined by the soil, crop grown, residue cover, length and degree of slope, amount and intensity of rain, and tillage.

Farmers can reduce sheet and rill erosion by using various combinations of the conservation practices described in this brochure. It may be helpful to consult with a trained soil conservationist when matching a combination of practices with the erosion control needs of a particular field.

Sheet erosion



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