

The reason for splash, sheet, and rill erosion's impact is that they occur on all unprotected surfaces, while gully erosion is a problem mainly on steep or long slopes.

Erosion does the most damage downslope where all forms of erosion are at work. At the top of the slope, splash and sheet erosion are the major forces doing harm.

## Sedimentation

So far, this outline of the erosion process has described how soil is detached and transported, but has said nothing about the destination for all of this mobile mud. The question remains, "Where are the soil particles carried?"

Soil is deposited in a process called "sedimentation." Whenever the flow of runoff water is interrupted, ponds develop. And when ponds develop, soil particles in the water settle to the ground.

Sedimentation can occur in small depressions in the field; above contour furrows; above small debris dams that are formed when residue collects in rills and gullies; by terrace channels; or in lakes and streams.

While most soil may only travel from one part of the field to another, a significant amount of soil particles can eventually reach various waterways. In fact, the Illinois Environmental Protection Agency has pinpointed soil as the number one agricultural pollutant in the state's waters.

Sediment can choke lakes and carry chemicals into waterways, making habitats uninhabitable for game fish. Everyone, from the farmer and the fisherman to the recreational enthusiast and the taxpayer, must pay for the damage.

## Absorb and Control

Erosion that is caused by man is not uncontrollable, though. The erosion process—from the time it begins with raindrops, all the way to the sedimentation stage—suggests two principle ways to reduce this destruction. First, absorb the energy of the raindrop; and secondly, control the flow of runoff water.

Both of these goals can be met by covering the ground with a growing crop or leaving crop residue on the soil surface. For example, by shifting to reduced tillage or by rotating row crops with small grains, hay, or sod-base meadow, the soil receives more protection.

The flow of runoff also can be controlled with contour farming, grass waterways, or terraces. The key is finding out which combination of these and other conservation practices can be used on your land to bring erosion within tolerable limits.

## T Values

Erosion becomes excessive when soil is being lost so fast that its natural productivity is being diminished. When erosion reaches this point, it is said to exceed the soil-loss tolerance level, also known as the T value.

The T value will vary according to soil type. But for most Illinois cropland soils, it ranges from 3 to 5 tons of soil loss per acre per year.

When soil is disturbed—by tillage, for example—the rate of erosion increases; but at the same time, nature also is able to rebuild soil at a faster rate. Tillage mixes organic material and nutrients, speeding up the soil-building process.

The rate of soil formation cannot be precisely measured, but the best estimate of soil scientists is that with undisturbed conditions, it takes nature about 300 years or more to form 1 inch of topsoil. However, when soil is disturbed by tillage, the length of time to build 1 inch of soil is reduced to about 30 years—assuming that ideal soil-building materials are at nature's disposal.

It should be noted, though, that tillage generally increases the rate of erosion significantly more than it increases the rate of soil formation. So in the long run, it still causes more soil loss.

According to current estimates, about 40 percent, or 9.5 million of the state's 24 million acres of cropland are suffering from excessive erosion. About 6 million of these acres have erosion that is about twice the soil-loss tolerance level. And on about 3.5 million acres, erosion ranges from twice to over 10 times the tolerance level.

Much of this soil loss is hard to spot with the naked eye; but the erosive forces are at work all the same, washing away truck-loads of soil.

The next time rain is falling on exposed soil, think about the image of the bomb. It will serve as a reminder of what's happening to the soil.

But also remember this: Raindrops are bombs that can be intercepted. With the proper mix of conservation practices, the healthy abundance of rainfall in Illinois does not have to mean an unhealthy abundance of soil erosion.

This publication was supported in part by a grant from the U.S. Environmental Protection Agency, Region V, Chicago, IL.

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Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. WILLIAM R. OSCHWALD, Director, Cooperative Extension Service, University of Illinois at Urbana-Champaign.

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August, 1985/5M/Land and Water number three