



KNOW SOIL KNOW LIFE



EROSION AND CONSERVATION

“The soil is the one indestructible, immutable asset that the nation possesses. It is the one resource that cannot be exhausted, that cannot be used up.” John Wesley Powell

Erosion is a natural process that affects soil in both natural and agricultural ecosystems. In natural ecosystems, these processes generally occur on geologic time scales, but human activity can accelerate them in agricultural ecosystems.

Erosion occurs when soil particles are detached, transported, and deposited elsewhere. Water, wind, ice (glaciers), and gravity are involved in transporting soil materials, and these are also the active agents in erosion. All are at work in natural ecosystems.

The erosion of soil is one of several natural and human threats to sustained soil productivity, which may become irreversible if not mitigated. However, there are practices that can be undertaken to reduce human effects and remain sustainable in the long run.

Such practices are referred to as best management practices (BMPs). These are activities that landowners and managers (whether urban, suburban, or rural, in forestry or agriculture) can use to help conserve soil and water resources.

Soil and Erosion Facts

- While about 38% of Earth’s land surface is agricultural, only 11% is arable land, capable of sustained production of the food and fiber needed to feed and clothe the approximately 7 billion people on Earth.
- Most arable soils currently are used to grow crops. The rest of the soils are too steep, shallow, hot, cold, wet, dry, or have chemical limitations that limit their potential to provide for an ever-growing populace.
- The rate of soil formation in humid and semiarid regions is approximately equal to the rate of erosion, so a somewhat constant amount of soil remains in place. This is not true of deserts, in which many soils have lost the entire A horizon, leaving bare surfaces, stone pavement, pedetaled plants, and/or gullied landscapes.

- At its worst, from about the 1950s through the 1970s, erosion from agricultural cropland in some areas exceeded 20 megagrams (metric tons) per hectare per year (8.9 tons per acre per year).
- About 2% of the top 15 centimeters (6 inches) of topsoil was being lost annually from some farms, decreasing agricultural productivity of those croplands by as much as 30%.
- A staggering 26.4 billion tons of soil is lost each year. That rate of loss is 10 times faster than soil is being replenished and is clearly not sustainable.

Conservation

Best management practices (BMPs) are proven to reduce erosion and pollution and improve water and environmental quality. BMPs can either address the source of a problem, the outcome of a problem, or both, and are helping to reverse the erosion trends listed above. They include:

- Better tillage systems have been developed that leave more crop residues on the surface,
- Some of the most erodible soils were taken out of crop production and planted to permanent vegetation (grass or trees).
- Since 1982, the combined wind and water erosion on agricultural cropland in the United States has been reduced by more than 43%, from 3.03 to 1.73 billion tons of soil annually (figure 6–6).

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