Canyon, the Badlands of South Dakota, the canyons of Utah, and the great river valleys.

If conditions in Illinois today were pristine, geologic erosion would occur at a low rate on level land; and on gentle slopes, erosion would only be a minor problem. With the state's humid conditions and ideal environment for plant growth, there would be a protective cover for the soil.

But needless to say, conditions today are not pristine.

Agriculture has replaced most of the protective cover with plants that are of more value to man—plants that don't cover the soil as effectively as the natural prairie growth. Some farmers leave the soil totally bare through much of the year.

The result? Erosion has increased to destructive proportions on some soils, carrying away topsoil and nutrients, washing pollutants into streams, filling waterways with sediment, and reducing the natural productivity of the land. (See Table 1.)

Although wind is behind some of the erosion in Illinois, water causes most of the problems. And here is where raindrops come into the picture.

Splash Erosion

Erosion caused by water can be broken into four categories—*splash* erosion, *sheet* erosion, *rill* erosion, and *gully* erosion. The first part, splash erosion, is the stage when raindrops strike the soil surface.

When rain falls vertically on a flat surface, splash erosion is equal in all directions. On a slope, more of the soil is splashed downhill than uphill; and in a wind-driven rainfall, splash movement depends on wind direction and slope steepness.

To observe the effects of splash erosion, look at a white fence or building by tilled soil just after a rain. Most likely, rain will have splashed soil as high as 3 feet on the fence or building.

Other visual reminders of erosion's impact are soil pedestals, which can be created with the University of Illinois' rain simulator, or sometimes during a heavy rain. When the simulator applies 2½ inches of rain per hour on bare soil, the particles underneath a stone or piece of residue remain protected. Meanwhile, erosion batters and washes away unprotected soil from around the object, sculpting a soil pedestal that conforms to the shape of the stone or residue.

Actually, if water didn't accumulate on the soil surface, the splashing of soil particles would not be a major concern. When particles are splashed, they are not moved far enough to greatly disturb the soil surface.

But the fact is that water *does* accumulate on the soil surface. If rain falls hard enough and long enough, the soil eventually will become saturated and seal up. The ground will have trouble absorbing more water; and in low spots, water will collect in ponds. If rain continues, these ponds ultimately will overflow and water will pour downhill.

At this point, the concern about splashed soil becomes clearer. Because raindrops have dislodged particles from the soil mass, runoff water can transport soil for great distances.

Table 1. Expected yields (percentage of normal yields under various erosion conditions and under high management for common slope groups)

Slope	High management, favorable subsoil			High management, unfavorable subsoil		
	Uneroded	Moderate erosion	Severe erosion	Uneroded	Moderate erosion	Severe erosion
(percent)	(percent)			(percent)		
0-2	100	97	90	100	95	80
2-5	99	96	89	99	94	79
5-10	97	94	87	96	91	76
10-15	93	90	83	91	86	71
15-20	87	84	77	85	80	65
20-25	80	77	70	78	73	58

This table, which is based on studies of Illinois soil types, shows the estimated percentage of normal yields you can expect under certain conditions. For example, if your land has a 2 to 5 percent slope, a favorable subsoil and is suffering from moderate erosion, you should receive an estimated 96 percent of normal yields.

Here are definitions of the terms used:

High management assumes that drainage, nutrients, plant population, tillage, planting, and harvesting are optimal. Also, weed and insect control is adequate and timely.

Uneroded includes a range from no to slight erosion.

Moderate erosion is significant erosion. Subsoil is evident in the plow layer of areas that have been freshly plowed.

Severe erosion is extreme erosion, a condition in which all or nearly all of the surface soil (or A horizon) and probably some of the subsoil has been lost.