# HOW SEASONAL IS EROSION?

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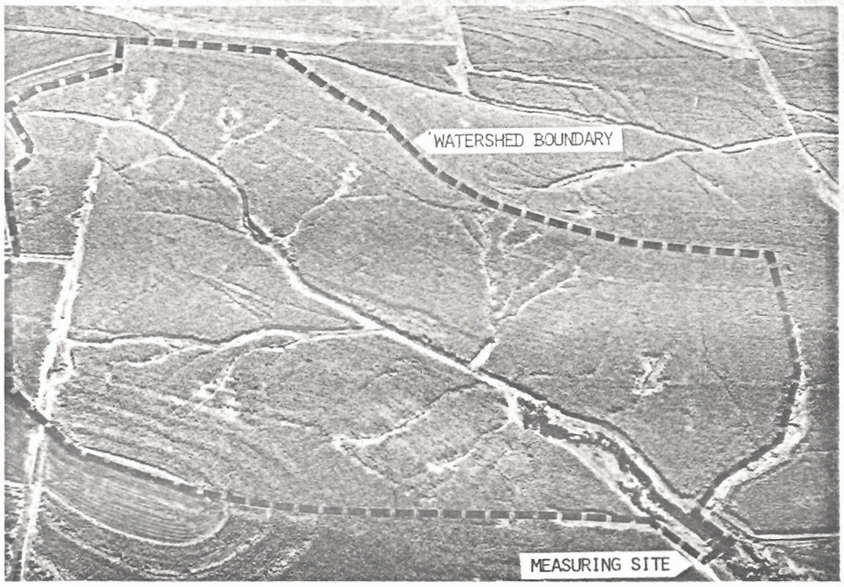
If you were farming hilly corn ground (9-percent average slope) using only such elemental conservation practices as contour planting and grass waterways, would you expect appreciable erosion--more than 20 tons per acre in an average year? Would you believe that more than 90 percent of this sediment movement would occur during May and June?

Streamflow from two 80-acre, field-size watersheds in the Missouri Valley Loessial region was measured and sampled for the 8-year period, 1965-1972. Results from both watersheds were essentially the same. An aerial view of one of these cornfields and the drainage network is shown in the photo below. The table lists sediment and sediment-causing variables and compares May-June sediment movement with annual quantities for the 8-year period of record. The sediment-causing variables included (1) rainfall amounts, (2) a rainfall erosivity measure that was the product of raindrop kinetic energy and a maximum 30-minute rainfall intensity, (3) a "watershed erodibility" measure that jointly considered rainfall erosivity and the watershed surface condition at the time an erosive rainstorm occurred, and (4) the amount of surface runoff.




Aerial view looking east at an 80-acre watershed near Treynor, Iowa.

Sediment and Sediment-causing Variables on a Field-size Watershed near Treynor, Iowa

| Sediment-causing Variables | Totals for 8-year Period | |
|---|---|---|
| | May-June | Annual |
| Rainfall Amount, inches | 85 | 262 |
| Rainfall Erosivity[1/] | 117,000 | 233,000 |
| Watershed Erodibility[1/] | 63,700 | 94,900 |
| Surface Runoff, inches | 21 | 35 |
| Sediment, tons/acre | 180 | 195 |

1/ From Wischmeier and Smith--Agriculture Handbook 282, USDA,ARS.

The May-June rainfall for the 8 years of measurement was one-third of total; rainfall erosivity was 50 percent of total; surface runoff was 61 percent of total; and the erodibility based on crop condition and occurring rainfall was 67 percent of total. The circumstances which caused a whopping 92 percent of the soil to be removed from the cornfields during May and June cannot be fully explained by any of these sediment-causing variables. Additional information which considers the "transport efficiency" of eroded soil particles is needed.

Soil losses in May and June, relative to losses during other months of the year, are higher than can be predicted from equations based on erosion mechanics. Continuing research at the North Central Watershed Research Center at Columbia is directed toward obtaining basic concepts of soil movement over field surfaces. This information, coupled with existing knowledge fo soil erosion obtained from experiment stations around the country, will facilitate the development of a sediment yield model which will have general application to fields and watersheds anywhere--with no geographic bias.