

## ESTIMATING SOIL EROSION FROM WATER USING THE UNIVERSAL SOIL LOSS EQUATION (USLE)

The water erosion equation is used to predict soil loss by water erosion from a specific land slope within a field. The equation is:

**A** = **R** x **K** x (**LS**) x **C** x **P** x **Pt** where

**A** = the predicted average annual soil loss in tons per acre per year from a given slope.

**R** = the rainfall factor. It is a measure of rainfall energy and intensity rather than just a rainfall amount. The R-factor values for Missouri are shown in Section I-(iv)-A-1.

**K** = the soil erodibility factor. It is a measure of the relative resistance of a soil to detachment and transport by water. K-values for any particular soil will be found in Section II-(i)-C of the FOTG.

**LS** = the slope length and steepness factor. It is the expected ratio of soil loss from a given field slope to that from a slope 72.6 feet in length with a uniform slope of 9 percent. Slope (L) is measured from the point of origin of overland flow to the point where deposition begins and/or where the water enters a defined channel. LS values are found in Section I-(iv)-A-3.

**C** = the crop and management factor. It is the ratio of soil loss from land cropped under specified conditions to the corresponding loss from clean-tilled, continuous fallow. This factor measures the combined effect of all the interrelated cover and management variables. (see Section I-(iv)-A-6 for values)

**P** = the support practice factor. It is the ratio of soil loss with a specific support practice to the corresponding soil loss with up-and-down hill culture. Support practices include contouring and contour strip cropping. (see Section I-(iv)-A-8)

**Pt** = the support practice factor for terracing. It is the ratio of soil loss with terraces to the soil loss without terraces and is based on relative sediment trapping efficiency. (see Section I-(iv)-A-8)

Soil erosion rates estimated with the USLE should not be added to rates estimated with the WEQ for conservation planning purposes unless the unsheltered distance (L) of the WEQ and the slope length (L) of the USLE are from identical locations with identical L-values within the field. This condition would seldom, if ever occur.