

APPENDIX K - SOIL LOSS (EROSION)

Calculating Soil Loss

Erosion losses are frequently estimated by the Universal Soil Loss Equation and the Revised Universal Soil Loss Equation (RUSLE). The basic equation is

$$A = R * K * LS * C * P$$

where:

- A = estimated average soil loss in tons per acre per year
- R = rainfall-runoff erosivity factor
- K = soil erodibility factor
- L = slope length factor
- S = slope steepness factor
- C = cover-management factor
- P = support practice factor

See the *Agriculture Handbook* (No. 703, USDA, 1997), which describes RUSLE in great detail.

Another factor for soil loss is called the "T value" which stands for "Tolerable Soil Loss." It is not directly used in RUSLE equation, but is often used along with RUSLE for conservation planning.

Soil Loss Tolerance (T)

Soil loss tolerance (T) is the maximum amount of soil loss in tons per acre per year, that can be tolerated and still permit a high level of crop productivity to be sustained economically and indefinitely. EPA encourages alternative approaches that tie the pollutant reductions to "T", the soil loss tolerance factor. "T" is defined as the maximum amount of erosion at which the quality of a soil as a medium for plant growth can be maintained. T factors commonly serve as objectives for conservation farm planning. These objectives assist in the identification of cropping sequences and management systems that will maximize production and sustain long-term productivity. T factors represent the goal for maximum annual soil loss, in the context of maintaining the long term sustainability goal. This includes maintaining (1) the surface soil as a seedbed for plants, (2) the interface between the air and the soil that allows the entry of air and water into the soil and still protect the underlying soil from wind and water erosion, and (3) the total soil volume as a reservoir for water and plant nutrients, which is preserved by minimizing soil loss.

For more information see *Natural Resources Conservation Service, National Soil Survey Handbook, title 430-VI* (Washington, D.C., U.S. Government Printing Office, September 1999).