

SOIL PARAMETERS USED IN EROSION PREDICTION

The following parameters are used as inputs in the soil erosion prediction models, or to group soils with similar properties affecting their susceptibility to wind and water erosion. This information can be found in Section II of the electronic Field Office Technical Guide under “County Soil Survey Area and Site Information”. Select the county you want soils data for. This will connect you to “Soil Data Mart”. Click on “Generate Reports” and “Select All” map units or choose the ones you are interested in. Select the report you want to generate. The Rusle2 parameters are located in a report called “Rusle2 Related Attributes” which includes the hydrologic group, K_f and T. The wind erosion related parameters are located in the “Physical Soil Properties” report.

Soil Erodibility Factor (K_f)

The Soil Erodibility Factor (K_f) indicates the susceptibility of the fine-earth fraction of the soil (material less than 2 millimeters in size) to sheet and rill erosion by water. Soil properties that influence erodibility by water are: (1) those that affect infiltration rate, movement of water through the soil, and water storage capacity; and (2) those that resist dispersion, splashing, abrasion, and transporting forces from rainfall and runoff. Soil properties which are most important have percent silt plus very fine sand, percent organic matter, percent sand coarser than very fine sand, structure, and permeability. Values of K_f range from 0.02 to 0.69. Generally, the higher the value, the more susceptible the soil is to sheet and rill erosion.

Soil-loss Tolerance Factor (T)

The Soil-loss Tolerance Factor (T) is an estimate of the maximum annual rate of soil erosion that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons of soil loss per acre per year. Values of T range from 1 to 5 tons depending on soil properties and prior erosion.

Soil-loss tolerances were subjectively evaluated based on the following general guides:

1. Maintenance of an adequate rooting depth for crop production.
2. Potential crop yield reduction.
3. Maintenance of water control structures affected by sedimentation.
4. Prevention of gullies.
5. Value of nutrients lost.

Wind Erodibility Index (I)

The Wind Erodibility Index (I) is the potential soil loss, in tons per acre per year; from a wide, level, unsheltered, isolated field with a bare, smooth, loose and noncrusted surface; under climatic conditions similar to those of the reference location which is Garden City, KS. Wind Erodibility Indices for various soil groups are listed in Table 1 on page 36.

Wind Erodibility Group (WEG)

The Wind Erodibility Group (WEG) is a grouping of soils that have similar properties affecting resistance to soil blowing. Soils are placed into wind erodibility groups on the basis of soil surface layer properties, primarily texture. The groups are 1, 2, 3, 4, 4L, 5, 6, 7, or 8. The soils assigned to group 1 are the most susceptible to wind erosion and those assigned to group 8 are least susceptible. A description of the Wind Erodibility Groups can be found in Table 1 on page 36.

Hydrologic Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-durations storms.

The four hydrologic soil groups are:

Group A – soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B – soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have a moderately fine to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C – soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils of moderately fine or fine texture. These soils have a slow rate of water transmission.

Group D – soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, and soils that have a clay pan or clay layer near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), then the first letter would be for drained areas and the second letter would be for non drained areas.