

ESTIMATING SOIL LOSS FROM WIND EROSION

The wind erosion equation $E = f(IKCLV)$ is used to estimate soil loss by wind erosion.

E = the predicted average annual soil loss expressed in tons per acre per year.

f = a function of.

I = the soil erodability. It is expressed as the average annual soil loss per acre that would occur from an "isolated," "level," "smooth," "unsheltered," "wide," and "bare" field with a noncrusted surface where the climatic factor is 100 percent.

K = the soil ridge roughness factor. This factor reflects the effect of ridging in the field being evaluated, compared to a standard height-spacing ratio of 1:4 (height of ridges: distance between ridges). Distance between ridges is measured parallel to the prevailing wind erosion direction.

C = the climatic factor. This factor is based on the average wind velocity and or the Thornthwaite precipitation effectiveness index for that location based on official weather records. Information on the location of Climate Data Stations for Nebraska is in Table 2 on pages 5 – 13.

L = the unsheltered distance across a field. For annual estimates using the critical period, this distance is along the prevailing wind erosion direction. For crop stage period estimates, L is an equivalent distance based on preponderance.

V = the vegetative cover. The "V" value is expressed as equivalent flat small grain residue (S_{Ge}). This value combines three conditions:

(1) The quantity of residue, (2) the kind of residue, and (3) the orientation of the residue.

The WEQ spreadsheet will be used for estimating wind erosion by crop stage periods (management period method). The [WEQ spreadsheet](#) (NE WEQv9.02 03-26-07.xls) is found in the eFOTG, Section IV, C. Tools along with instructions and Nebraska specific user notes. General instructions for using the spreadsheet are also included as a tab (worksheet) on the spreadsheet. A copy of the WEQ spreadsheet and several example templates are also located on the O:\ drive (O:\WEQ). It is recommended that the planner use the existing templates and not attempt to develop templates from scratch or make these calculations manually.

To use the spreadsheet, the user needs to have basic EXCEL spreadsheet skills, plus an understanding of wind erosion processes as described in the National Agronomy Manual, Part 502. It is also helpful to have an understanding of factors that affect wind erosion prediction and control such as field orientation, unsheltered wind distance, climatic factors, soil type, ridge roughness, crop rotations and differences in residue types, tillage operations, farm equipment, irrigation and management impacts such as grazing/forage removal and use of cover crops

Questions regarding wind erosion should be directed to the State Resource Staff (State Agronomist).