RUSLE P SUBFACTOR VALUES FOR CONTOURING

Step 1. Gather appropriate information.

a) Identify the hydrologic soil group for the selected profile soil.

b) Determine the length and slope gradient of the landscape profile, and grade along the furrows.

c) Identify the 10-year storm erosivity (10-yr EI) value for the site.

d) Select the Cover-Management Condition using Table 1, "Cover Management Conditions."

e) Select the appropriate ridge height using Table 2, "Guidelines for Selecting Ridge Heights for Contouring with RUSLE."

Step 2. Determine the P subfactor for contouring "on grade."

a) With 10-yr EI value, ridge height,* hydrologic soil group, and cover-management condition, select the appropriate part of Table 3, "RUSLE Contour P Subfactor Tables for On Grade Condition".

b) Enter the selected table proceeding down the column for the hydrologic soil group and read the value in the row for the slope steepness. The resulting value is the P subfactor value for contouring "on grade".

Step 3. Adjust contouring P subfactor for furrow grade.

a) Calculate the ratio of the field's average furrow grade to its landscape profile slope used to describe the field's topographic factor and round to the nearest 0.1. Given that the furrow grade and landscape profile slope generally are inexact estimates with only one significant figure, do not attempt for more precision by rounding to the nearest hundredth. For ratio values less than 0.05, go to step 4 as no adjustment is required for this "off-grade" contouring.

b) For ratio values of 0.05 and larger, go to Table 4, "Contouring P Subfactor Value Adjusted for Furrow Grade."

c) In the left-most column of Table 4, locate the P-factor value for on-grade contouring obtained from step 2 above. If the P factor value is an odd number, round up or down to the nearest even number listed in Table 4. Round in the opposite direction than you did when rounding the furrow grade to landscape profile slope ratio to the nearest 0.1. On the located row, move right to the column for the appropriate ratio of furrow grade to slope steepness of the landscape profile. This value is the RUSLE P subfactor value for "off grade" contouring where the slope is less than the critical slope. Beyond the critical slope length, the practice effectiveness decreases quickly with greater slope length.

Step 4. Determine the critical slope length.

a) Refer to Figures 1-23 and select the applicable figure for the hydrologic soil group, and Cover-Management Condition 1-7.

b) Enter the selected figure at the landscape profile slope on the horizontal axis and project a vertical line up to intersect the 10-yr EI value (EI10) for the site. From that intersection project a horizontal line to the left and read the critical length. This is the critical length, which is the maximum slope for which the previously determined P subfactor value applies. Use the previously determined P subfactor value for slopes less than critical.

c) Stripcropping increases the effectiveness of contouring. When used in conjunction with contouring, increase the critical slope length by multiplying the value from b (above) by 1.5.

Step 5. Adjust the contouring P subfactor where the landscape profile exceeds the critical slope length.

a) Where landscape profile slope exceeds the critical, divide the landscape profile slope length by the critical slope length. Be sure to increase the critical slope length if stripcropping applies. (The P subfactor value increases as a function of the ratio of landscape profile slope length to critical length where the ratio exceeds a value of one.)

b) Use the same rill/interrill ratio if used previously in determining the topographic (LS) factor at the site. Otherwise select the ratio from the following: Medium, when the interrill erosion and rill erosion are "balanced" which is the case for most cultivated cropland in row crops and small grains; Low, when most of the soil loss is caused by interrill erosion, which is the case for rangelands, pasture lands, and situations where consolidated soil is resistant to erosion; High where most of the erosion is rill erosion, which is often the case for construction sites immediately after disturbance.

c) Go to Figures 29-31. Select the appropriate figure with the rill/interrill ratio and the percent slope.

d) From the slope length/critical length ratio on the horizontal axis of the selected figure, project a vertical line to intersect the P subfactor value determined in step 2 or 3 above. From that intersection project a horizontal line to the left and read the effective P subfactor value. This subfactor value is the corrected P subfactor value for contouring for the entire landscape profile slope length

Step 6. Compute rotational contouring P subfactor where cover-management conditions and/or ridge heights change from year to year during the life of a crop rotation.

a) Where the crop rotation planned for the field will cause cover-management conditions and/or ridge heights to change from year to year during the critical erosion period, calculate the average annual P subfactor. It is the weighted average of the P subfactors

calculated for each cover management condition and ridge height presented during the critical erosion period for each year in the life of the rotation.

b) For each cover management condition and ridge height presented by each year in the crop rotation during the critical erosion period, calculate the contour P subfactor following the appropriate steps 1-5 above.

c) Multiply the contour P subfactor value for crops with the same cover-management condition and ridge height by the number of the years they occur in the rotation.

d) Sum these different sets of multiplied values and divide by the total years in the rotation to yield an average annual contour P subfactor value.

Example A:

Step 1. Gather information.

a) Hydrologic soils group B.

b) Landscape profile slope = 6%, slope length = 150 feet. Furrow grade = 1%.

c) For the site near Lewiston, Maine, the 10-yr EI = 60, and the R value applies to the site.

d) When row cropped, clean tilled corn is grown. This is Cover-Management Condition 6.

e) Ridges and furrows made during corn planting range 3-4 inches in depth so they are Moderate Ridges.

Step 2. Determine the P subfactor for contouring "on grade."

a) In Table 3, Condition 6, EI=60 (10-yr Storm EI = 60, and Cover Management Condition 6), select the table for Moderate Ridge Height (3-4" Ridges).

b) Find the column for hydrologic soils group B and the value in the intersected row for 6% slope. Read the P subfactor value of 0.21.

Step 3. Adjust contouring P subfactor for furrow grade.

a) The furrow grade/slope grade ratio is calculated as $1.0/6 \doteq 0.167$ rounded to 0.2.

b) Go to Table 4 as ratio indicates a correction applies.

c) Since Table 4 does not have a line for 0.21, round the value up or down between 0.20 and 0.22. Since the furrow grade/slope grade ratio was rounded up, round down this time to 0.20. Enter Table 4 with the on grade contouring P subfactor value of 0.20 and read across to the furrow grade/slope grade ratio of 0.2. The value is 0.56. It is the P subfactor value for "off grade" contouring where the slope is less than the critical slope.

Step 4. Determine the critical slope length.

a) With Figure 10 for hydrologic soils group B, and Cover-Management Condition 6, and the 6% slope, read a critical length of 510 feet. The critical slope exceeds the 150-foot slope