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**VERMONT BULLETIN NO. VT-180-4-9**

March 23, 2004

**SUBJECT: CPA—IMPLEMENTATION OF THE REVISED UNIVERSAL SOIL LOSS EQUATION, VERSION 2 (RUSLE2)**

**TO: All Field Offices**

**Purpose:** To announce the release of the RUSLE2 computer model and to provide guidance and clarification on when and how RUSLE2 will be used for conservation planning in Vermont

**Expiration Date:** September 30, 2004

**Background.** RUSLE2 was originally directed to be fully implemented by December 30, 2002. While unexpected problems resulted in a delayed target delivery date, NRCS has completed the development of the RUSLE2 model, which is now available to States for implementation in field offices.

**Explanation.** Training has been provided to NRCS Vermont field office conservation planners so that implementation can occur immediately. RUSLE2 rill and inter-rill erosion estimates have changed in many cases from previously released erosion estimate models. As 2004 contracts are developed, it is important that the most up-to-date technology is used to insure that conservation planning requirements are accurate based on current technology. The Soil Condition Index (SCI) calculation has been integrated into the newest version of RUSLE2, which is required for Resource Management System (RMS) planning. Additionally, there is a sense of urgency surrounding the possible use of RUSLE2 technology for determining producer eligibility in the Conservation Security Program (CSP).

#### **Overall Use of RUSLE2 in Conservation Planning**

RUSLE2 provides estimates of several different types of erosion and sediment delivery. Vermont NRCS employees will use the “**Soil Loss for Conservation Planning**” number in RUSLE2 when evaluating soil erosion from agricultural fields and to determine if soil erosion meets the Quality Criteria for Soil Loss.

RUSLE2 will be used to:

- 1) Estimate rill and inter-rill erosion on cropland, hayland and pasture to determine if the Quality Criteria for Soil Erosion – Sheet and Rill is being met for the benchmark condition and planned alternatives (rill and inter-rill erosion does not exceed the Soil Loss Tolerance “T”);
- 2) Estimate the Soil Condition Index on cropland, hayland and pasture to determine if the Quality Criteria for Soil Condition – Organic Matter Depletion is being met for the benchmark condition and planned alternatives (positive SCI);
- 3) Estimate the Soil Tillage Intensity Rating (STIR).

#### **Adjusting Percent Rock Cover in RUSLE2**

Users of RUSLE2 have the option to add rock cover as a surface cover for certain soils. Default rock cover percentages will be posted in eFOTG, Section I, Erosion Prediction, RUSLE 2. These posted percentages will be the maximum rock covers allowed for the specified soil map units in lieu of site specific collected data, such as line transect data.

#### **Development of new Crop Management Templates in RUSLE2**

Local and regional specialists have built an extensive selection of Crop Management Templates into the RUSLE2 database for Vermont. These templates can be selected and used to estimate soil erosion for most crop management

systems used by farmers in Vermont. However, there will be non-typical crop management systems for which new templates will need to be developed.

**All new crop management templates should be developed and saved by the State Office.** This restriction is needed for several reasons. First, the current version of RUSLE2 still has a few “bugs” in it. One of these “bugs” can result in the loss of data if individuals try to save new crop management templates. Second, all crop management templates need to be approved by the State Agronomist and added to the database of managements for Vermont by the national RUSLE2 coordinator. These management templates will then become available to all users of RUSLE2.

Please contact Bob Sylvester or Sandra Primard at the State Office if you have the need for new and additional crop management templates.

### **Use of Filter Strips in RUSLE2 Calculations**

National policy requires that conservation planners use the soil loss number from the “Soil Loss for Conservation Planning” field in RUSLE2 when estimating soil erosion. This estimate of soil loss is reduced greatly when filter strips are added mid-slope or at the end of the slope. The reduction in erosion is due to a combination of sediment trapping, decreasing slope length and creating a backflow and deposition upslope from the filter area. As such, this estimate no longer reflects the amount of soil being lost from the erodible portion of the field. The RUSLE2 developers also assumed that sediment trapped in the filter strip would be removed and re-applied to the field.

When using RUSLE2 to estimate soil loss for conservation planning purposes **do not include filter strips** as a component of the RUSLE2 management scenario.

### **Use of RUSLE2 for SCI and STIR**

The Soil Conditioning Index (SCI) and the Soil Tillage Intensity Rating (STIR) are two new indexes that can be used to better understand management affects on soil quality. These indexes are available in several formats including an Excel spreadsheet. The SCI is a required RMS tool when evaluating soil quality. The STIR is not currently on the list of required RMS tools, but may be in the future. It may also be required for use in the new Conservation Security Program.

**All SCI and STIR calculations undertaken in Vermont will be performed using the latest authorized version of RUSLE2.** This will also eliminate the need to re-enter soils, climate and management data that would normally be input into RUSLE2.

### **Status of Soil Data in RUSLE2**

At this time there are errors associated with all of the soil data in Essex County. The soil data for Caledonia, Orleans and Chittenden Counties has errors associated with some of the soil map units, primarily the silt loams. When you select these soil map units in RUSLE2 an error message will appear that says the data is inconsistent. The Vermont Soils Staff should have these errors corrected within a few weeks.

In the meantime there are two ways that you can work around the problem when you get this error message:

- 1) You can select the same soil from an adjacent county, if it exists, or
- 2) You can select a soil of the same texture class from the “Generic” pull down list, instead of picking a county. Please do not use this Generic list unless there is no other recourse available, the RUSLE2 results may vary considerably compared to using the actual soil map unit.

### **Use of RUSLE2 by TSP's**

Currently, the policy and guidance for general Conservation Planning, Nutrient Management Planning and Comprehensive Nutrient Management Plans (CNMP's) requires that NRCS provide the soil erosion estimates based on RUSLE2 calculations. Because no Technical Service Providers (TSP's) are currently certified in conservation planning, they are not expected to use RUSLE2 for NRCS technical assistance projects. At this time no local RUSLE2 training is planned for TSP's. A national on-line training course is currently being developed.

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If you have questions on general policies concerning RUSLE2 contact Jim Wood, State Resource Conservationist.  
Contact Sandra Primard at the State Office if your questions concern technical issues related to the use of RUSLE2.

Francis M. Keeler  
State Conservationist