

Dated: May 28, 1996.  
Kenneth C. Clayton,  
Acting Administrator.  
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## Natural Resources Conservation Service

### 7 CFR Part 610

#### Technical Assistance

**AGENCY:** Natural Resources Conservation Service, USDA.

**ACTION:** Final rule.

**SUMMARY:** Section 301(c) of the Federal Agriculture Improvement and Reform Act of 1996 (FAIRA) requires the Secretary of Agriculture to publish in the Federal Register, within 60 days of the enactment of FAIRA, the universal soil loss equation (USLE) and wind erosion equation (WEQ) used by the Department of Agriculture (the Department) as of the date of publication. The Natural Resources Conservation Service (NRCS) utilizes factors from the USLE, the revised universal soil loss equation (RUSLE) and the WEQ in equations to predict soil erosion due to water and wind. The Department was first required to use the factors from the USLE and WEQ to make highly erodible land (HEL) determinations under the Food Security Act (FSA) of 1985, Pub. L. 99-198. The FSA defined HEL as land that has the potential for an excessive annual rate of erosion in relation to the soil loss tolerance level as determined by the Secretary through application of factors from the USLE and WEQ.

This final rule sets forth the USLE and WEQ used by the Department as of this date and the circumstances under the equations are used. Since the first mandated use of the USLE in 1985, the technology used to predict soil erosion due to water has been refined. The refinement is reflected in a revised USLE (RUSLE) which will also be used under the circumstances described in this rule.

**EFFECTIVE DATE:** This rule is effective June 3, 1996.

**FOR FURTHER INFORMATION CONTACT:** David L. Schertz, National Agronomist, Natural Resources Conservation Service, P.O. Box 2890, Washington, D.C. 20013; Fax 202-720-2646 or Internet:dschertz@usda.gov.

#### SUPPLEMENTARY INFORMATION:

Rulemaking Analyses

*EO 12291:* Not major.

*Regulatory Flexibility Act:* No significant impact.

*Paperwork Reduction Act:* Does not apply.

*National Environmental Policy Act:* Not applicable.

*Civil Rights Impact Analysis:* Not applicable.

*Federalism Assessment:* Does not have sufficient federalism implications to warrant an assessment.

*Unfunded Mandate:* Not applicable.

#### Background And Purpose

The Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture (the Department), utilizes the universal soil loss equation (USLE), the revised universal soil loss equation (RUSLE) and the wind erosion equation (WEQ) to predict soil erosion due to water and wind. Section 301(c) of the Federal Agriculture Improvement and Reform Act of 1996 (FAIRA), which was enacted April 4, 1996, requires the Secretary of Agriculture to publish in the Federal Register by June 3, 1996, the USLE and WEQ used by the Department as of the date of publication. NRCS is publishing the equations and the rules under which the USLE, RUSLE, and WEQ factors are used for administering programs.

The equation for predicting soil loss due to erosion for both the USLE and RUSLE is  $A=R \times K \times L \times S \times C \times P$ . The factors in the equation have the following definitions:

1. *A* is the estimation of average annual soil loss in tons per acre caused by sheet and rill erosion.
2. *R* is the rainfall erosivity factor.
3. *K* is the soil erodibility factor.
4. *L* is the slope length and steepness factor.
5. *C* is the cover and management factor.
6. *P* is the support practice factor.

A paper published by K.G. Renard, et al., in the May-June, 1994 Journal of Soil and Water Conservation, volume 49(3), pages 213-220, entitled, "RUSLE revisited: Status, questions, answers, and the future", describes the revision. Primary differences between the USLE and RUSLE include the following:

*R Factor:* RUSLE includes more *R* values for the Western United States than the USLE. For the eastern United States, *R* values are generally the same as those used in the USLE but includes some revisions.

*K Factor:* Values used in RUSLE are similar to the USLE values but are adjusted to account for changes, such as freezing and thawing, and soil moisture. These adjustments are calculated at one-half month intervals for use in RUSLE

and are applicable in the northern and southern plains, midwest, southern, and eastern United States.

*LS Factor:* USLE uses one *LS* table; RUSLE uses four *LS* tables, as determined by the relationship of rill to interrill erosion. Although both the USLE and RUSLE can account for the effects of complex slopes, RUSLE simplifies this *LS* determination through the use of computer technology.

*C Factor:* USLE provides estimates of soil changes for 4-5 crop stage periods throughout the year. RUSLE provides estimates of cover and soil changes on one-half month intervals, especially in relation to canopy, surface residue, residue just under the surface, and the effects of climate on residue decomposition, roughness, roots, and soil consolidation.

*P Factor:* USLE uses *P* factors for contouring, contour stripcropping, and terracing from table values established for field slope ranges; and for terraces, the *P* factor is also based on channel gradients. RUSLE uses *P* factors for farming across the slope and includes new process-based routines to determine the effect of stripcropping and buffer strips. Values for farming across the slope are based on slope length and steepness, row grade, ridge height, storm severity, soil infiltration, and the cover and roughness conditions. The stripcropping *P* factor is based on the amount and location of soil deposition.

The equation for predicting soil loss due to wind erosion is  $E=f(IKCLV)$ . The factors in the equation have the following definitions:

1. *E* is the estimation of average annual soil loss in tons per acre.
2. *f* indicates the equation includes functional relationships that are not straight-line mathematical calculations.
3. *I* is the soil erodibility index.
4. *K* is the ridge roughness factor.
5. *C* is the climatic factor. All climatic factor values are expressed as a percentage of the value established at Garden City, Kansas. Garden City, Kansas was the location of early research in the WEQ and established the standard for climatic factors against which the other locations are measured.
6. *L* is the unsheltered distance across an erodible field, measured along the prevailing wind erosion direction.
7. *V* is the vegetative cover factor.

The Department was first statutorily required to use the factors from the USLE and WEQ to make highly erodible land (HEL) determinations under the Food Security Act (FSA) of 1985, Pub. L. 99-198. The Department published the equations used to determine HEL during promulgation of the regulations

implementing the HEL and wetland conservation provisions of the FSA, 7 CFR Part 12 (see Federal Register, Vol. 52, No. 180, page 35194, September 17, 1987). Section 12.21 provides that land in a soil map unit will be considered to be highly erodible if the quotient of either the RKLS/T or the CI/T equals or exceeds 8. The factors, R, K, and LS are from the USLE. The USLE factors are explained in the U.S. Department of Agriculture Handbook 537. The factors C and I are from the WEQ. The WEQ factors are explained in a paper by N.P. Woodruff and F.H. Siddaway, 1965. The soil loss tolerance (T) value represents the average annual rate of soil erosion that could occur without causing a decline in long term productivity. The specific factors values which are used for determining whether soil map units are considered to be highly erodible are published in the local Field Office Technical Guide (FOTG) which is maintained in each NRCS field office. The values published as of January 1, 1990, in the FOTG are the basis for all HEL determinations. The FOTG is available for review in each NRCS field office. The values vary across the country to correspond to differences in climate, soil types, and topography.

Since the publication of the USLE in 1985, additional research on erosion processes has resulted in refined technology for determining the factor values in the USLE. RUSLE represents a revision of the USLE technology in how the factor values in the equation are determined. RUSLE is explained in the U.S. Department of Agriculture Handbook 703, "Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)."

Since the passage of the FSA in 1985, USLE and WEQ have been used to compile the highly erodible soils list and to make highly erodible field determinations. USLE has been used to develop conservation plans and revisions and to conduct status reviews. As new understanding is gained through research on erosion processes, updates of erosion prediction equations can occur. Changing the highly erodible soils list and field determinations each time these technologies are updated would be disruptive to farmers and impractical for long range planning. Therefore, no changes to the existing highly erodible soils list or field determinations will be made as a result of the implementation of RUSLE. However, as technology is improved, such as with RUSLE, NRCS will use it to develop new conservation plans, plan revisions, and to conduct status reviews. NRCS will not require producers to

meet more restrictive levels of erosion reduction that might result from using RUSLE instead of USLE while carrying out existing conservation plans. Therefore, all existing conservation plans developed using USLE, that have been implemented, will remain acceptable plans for purposes of the HEL conservation provisions of the FSA.

#### List of Subjects in 7 CFR Part 610

Soil conservation, Technical assistance, Water resources.

For the reasons set forth above, 7 CFR Part 610 is amended as follows:

### PART 610—TECHNICAL ASSISTANCE

1. The authority for Part 610 is revised to read as follows:

Authority: 16 U.S.C. 590a–590f, 590q, 3801(a)(9).

#### §§ 610.1–610.5. [Designated as Subpart A]

2. Sections 610.1 through 610.5 are designated as subpart A—Conservation Operations.

3. Section 610.1 is revised to read as follows:

##### § 610.1 Purpose.

This subpart sets forth Natural Resource Conservation Service (NRCS) policies and procedures for furnishing technical assistance in conservation operations.

4. Subpart B—Soil Erosion Prediction Equations containing §§ 610.11 through 610.14 is added to read as follows:

#### Subpart B—Soil Erosion Prediction Equations

Sec.

610.11 Purpose and scope.

610.12 Equations for predicting soil loss due to water erosion.

610.13 Equations for predicting soil loss due to wind erosion.

610.14 Use of USLE, RUSLE, and WEQ.

#### Subpart B—Soil Erosion Prediction Equations

##### § 610.11 Purpose and scope.

This subpart sets forth the equations and rules for utilizing the equations that are used by the Natural Resources Conservation Service (NRCS) to predict soil erosion due to water and wind. Section 301 of the Federal Agriculture Improvement and Reform Act of 1996 (FAIRA) and the Food Security Act, as amended, 16 U.S.C. 3801–3813 specified that the Secretary would publish the universal soil loss equation (USLE) and wind erosion equation (WEQ) used by the Department within 60 days of the enactment of FAIRA. This subpart sets forth the equations, definition of factors, and provides the

rules under which NRCS will utilize the USLE, the revised universal soil loss equation (RUSLE), and the WEQ.

#### § 610.12 Equations for predicting soil loss due to water erosion.

(a) The equation for predicting soil loss due to erosion for both the USLE and the RUSLE is  $A=R \times K \times LS \times C \times P$ . (For further information about USLE see the U.S. Department of Agriculture Handbook 537, "Predicting Rainfall Erosion Losses—A Guide to Conservation Planning," dated 1978. Copies of this document are available from the Natural Resources Conservation Service, P.O. Box 2890, Washington, DC 20013. For further information about RUSLE see the U.S. Department of Agriculture Handbook 703, "Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)." Copies may be purchased from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.)

(b) The factors in the USLE equation are:

(1) *A* is the estimation of average annual soil loss in tons per acre caused by sheet and rill erosion.

(2) *R* is the rainfall erosivity factor. Accounts for the energy and intensity of rainstorms.

(3) *K* is the soil erodibility factor. Measures the susceptibility of a soil to erode under a standard condition.

(4) *LS* is the slope length and steepness factor. Accounts for the effect of length and steepness of slope on erosion.

(5) *C* is the cover and management factor. Estimates the soil loss ratio for each of 4 or 5 crop stage periods throughout the year, accounting for the combined effect of all the interrelated cover and management variables.

(6) *P* is the support practice factor. Accounts for the effect of conservation support practices, such as contouring, contour stripcropping, and terraces on soil erosion.

(c) The factors in the RUSLE equation are defined as follows:

(1) *A* is the estimation of average annual soil loss in tons per acre caused by sheet and rill erosion.

(2) *R* is the rainfall erosivity factor. Accounts for the energy and intensity of rainstorms.

(3) *K* is the soil erodibility factor. Measures the susceptibility of a soil to erode under a standard condition and adjusts it bi-monthly for the effects of freezing and thawing, and soil moisture.

(4) *LS* is the slope length and steepness factor. Accounts for the effect of length and steepness of slope on

erosion based on 4 tables reflecting the relationship of rill to interrill erosion.

(5) *C* is the cover and management factor. Estimates the soil loss ratio at one-half month intervals throughout the year, accounting for the individual effects of prior land use, crop canopy, surface cover, surface roughness, and soil moisture.

(6) *P* is the support practice factor. Accounts for the effect of conservation support practices, such as cross-slope farming, stripcropping, buffer strips, and terraces on soil erosion.

#### **§ 610.13 Equations For Predicting Soil Loss Due To Wind Erosion.**

(a) The equation for predicting soil loss due to wind in the Wind Erosion Equation (WEQ) is  $E = f(IKCLV)$ . (For further information on WEQ see the paper by N.P. Woodruff and F.H. Siddaway, 1965. "A Wind Erosion Equation," Soil Science Society of America Proceedings, Vol. 29, No. 5, pages 602-608, which is available from the American Society of Agronomy, Madison, Wisconsin. In addition, the use of the WEQ in NRCS is explained in the Natural Resources Conservation Service (NRCS) National Agronomy Manual, 190-V-NAM, second ed., Part 502, March, 1988, which is available from the NRCS, P.O. Box 2890, Washington, DC 20013.)

(c) The factors in the WEQ equation are defined as follows:

(1) *E* is the estimation of the average annual soil loss in tons per acre.

(2) *f* indicates the equation includes functional relationships that are not straight-line mathematical calculations.

(3) *I* is the soil erodibility index. It is the potential for soil loss from a wide, level, unsheltered, isolated field with a bare, smooth, loose and uncrusted surface. Soil erodibility is based on soil surface texture, calcium carbonate content, and percent day.

(4) *K* is the ridge roughness factor. It is a measure of the effect of ridges formed by tillage and planting implements on wind erosion. The ridge roughness is based on ridge spacing, height, and erosive wind directions in relation to the ridge direction

(5) *C* is the climatic factor. It is a measure of the erosive potential of the wind speed and surface moisture at a given location compared with the same factors at Garden City, Kansas. The annual climatic factor at Garden City is arbitrarily set at 100. All climatic factor values are expressed as a percentage of that at Garden City.

(6) *L* is the unsheltered distance. It is the unsheltered distance across an erodible field, measured along the prevailing wind erosion direction. This

distance is measured beginning at a stable border on the upwind side and continuing downward to the nonerodible or stable area, or to the downwind edge of the area being evaluated.

(7) *V* is the vegetative cover factor. It accounts for the kind, amount, and orientation of growing plants or plant residue on the soil surface.

#### **§ 610.14 Use of USLE, RUSLE, and WEQ.**

(a) All Highly Erodible Land (HEL) determinations are based on the formulas set forth in 7 CFR § 12.21 using some of the factors from the USLE and WEQ and the factor values that were contained in the local Field Office Technical Guide (FOTG) as of January 1, 1990. In addition, this includes the soil loss tolerance values used in those formulas for determining HEL. The soil loss tolerance value is used as one of the criteria for planning soil conservation systems. These values are available in the FOTG in the local field office of the Natural Resources Conservation Service.

(b) RUSLE will be used to:

(1)(i) Evaluate the soil loss estimates of conservation systems contained in the FOTG.

(ii) Evaluate the soil loss estimates of systems actually applied, where those systems were applied differently than specified in the conservation plan adopted by the producer or where a conservation plan was not developed, in determining whether a producer has complied with the HEL conservation provisions of the Food Security Act of 1985, as amended, 16 U.S.C. § 3801 *et seq.*, set forth in 7 CFR Part 12; and

(2) Develop new or revised conservation plans.

Dated: May 30, 1996.

Paul W. Johnson,  
Chief, Natural Resources Conservation Service.

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### **Agricultural Marketing Service**

#### **7 CFR Part 928**

[Docket No. FV96-928-1-IFR]

#### **Papayas Grown in Hawaii; Assessment Rate**

**AGENCY:** Agricultural Marketing Service, USDA.

**ACTION:** Interim final rule with request for comments.

**SUMMARY:** This interim final rule establishes an assessment rate for the Papaya Administrative Committee (Committee) under Marketing Order No.

928 for the 1996-97 and subsequent fiscal periods. The Committee is responsible for local administration of the marketing order which regulates the handling of papayas grown in Hawaii. Authorization to assess papaya handlers enables the Committee to incur expenses that are reasonable and necessary to administer the program.

**DATES:** Effective on July 1, 1996.

Comments received by July 5, 1996, will be considered prior to issuance of a final rule.

**ADDRESSES:** Interested persons are invited to submit written comments concerning this rule. Comments must be sent in triplicate to the Docket Clerk, Fruit and Vegetable Division, AMS, USDA, P.O. Box 96456, room 2523-S, Washington, DC 20090-6456, FAX (202) 720-5698. Comments should reference the docket number and the date and page number of this issue of the Federal Register and will be available for public inspection in the Office of the Docket Clerk during regular business hours.

#### **FOR FURTHER INFORMATION CONTACT:**

Mary Kate Nelson, Marketing Assistant, California Marketing Field Office, Fruit and Vegetable Division, AMS, USDA, 2202 Monterey Street, suite 102B, Fresno, California 93721, telephone (209) 487-5901, FAX (209) 487-5901, or Charles L. Rush, Marketing Specialist, Marketing Order Administration Branch, Fruit and Vegetable Division, AMS, USDA, P.O. Box 96456, room 2523-S, Washington, DC 20090-6456, telephone (202) 720-5127, FAX (202) 720-5698.

**SUPPLEMENTARY INFORMATION:** This rule is issued under Marketing Agreement No. 928 and Order No. 928, both as amended (7 CFR part 928), regulating the handling of papayas grown in Hawaii, hereinafter referred to as the "order." The marketing agreement and order are effective under the Agricultural Marketing Agreement Act of 1937, as amended (7 U.S.C. 601-674), hereinafter referred to as the "Act."

The Department of Agriculture (Department) is issuing this rule in conformance with Executive Order 12866.

This rule has been reviewed under Executive Order 12778, Civil Justice Reform. Under the marketing order now in effect, handlers of papayas grown in Hawaii are subject to assessments. Funds to administer the order are derived from such assessments. It is intended that the assessment rate as issued herein will be applicable to all assessable papayas beginning July 1, 1996, and continuing until amended, suspended, or terminated. This rule will not preempt any State or local laws,