

INTRODUCTION
Food Security Act Documentation Material

This document is a summary of the material developed for Food Security Act (FSA) planning purposes in Hawaii and the Pacific Basin (Guam and the Commonwealth of the Northern Mariana Islands). This material was developed by the United States Department of Agriculture (USDA) Soil Conservation Service (SCS) offices in Hawaii and the Pacific Basin with assistance from the SCS West National Technical Center and numerous farmers, sugar plantation personnel, and others.

Guidesheets listing Alternative Conservation Systems (ACS's) applicable on specific treatment units were developed for sugarcane and truck crops on Highly Erodible Land (HEL) in Hawaii and in the Pacific Basin.

ACS's are comprised of a set of conservation practices which would reduce both sheet and rill erosion and ephemeral gully erosion to an acceptable level approved by the SCS Hawaii state conservationist. Only the most cost-effective ACS's are included on the guidesheets. Appendix 12 includes the Cost of Practices and Treatments. Erosion due to wind was not included in the analysis because data needed to use the wind loss equation is not available for Hawaii. Factors which influence the applicability of conservation practices and the development of ACS's include type of crop, land slope, complexity of slope, and the availability of a suitable outlet for water. Treatment units were therefore developed to account for these factors on a SCS field office by field office basis. All HEL soils presently used for sugarcane or truck crop production were then sorted into the appropriate treatment units. See pages 5, 6, and 7 for a listing of treatment units by SCS field office and crop.

The ACS's include standard SCS management and structural-type practices and also treatments not previously identified. See page 8 for a list of the conservation practices and treatments (hereafter referred to collectively as

practices) considered for FSA planning purposes. Information about these practices is included in the Standards and Specifications for FSA Conservation Practices beginning on page 9.

The application of conservation practices would reduce sheet and rill erosion and/or ephemeral gully erosion. The application of management-type conservation practices would reduce sheet and rill erosion or A as measured by the Universal Soil Loss Equation (USLE), more specifically the cover and management factor "C" or erosion control practice "P" factor values in the USLE equation. Table A on page 22 shows the percent reduction in C or P factor values due to management practices applicable on sugarcane land. Table B on page 41 shows similar information for management practices applicable on truck crop land. Documentation regarding how these percentages were determined follow each of the tables.

When management practices which reduce the C factor value are applied in combination with one another, their effects are assumed to be either overlapping or cumulative. Practices are considered overlapping if the application of one practice lessens the effectiveness of another. If practices are overlapping, credit for only one of the practices was claimed. If practices are not overlapping, then the percent reduction in C for each practice was multiplied in a cumulative fashion to get a total percent reduction in C. Table B-1 on page 28 shows the percent reduction in C due to combinations of management practices applicable on sugarcane land at all field offices, except the Pahala Field Office. Table B-2 on page 31 shows similar information for the Pahala Field Office. Table F on page 50 shows similar information for practices applicable on truck crop land for all field offices. Documentation regarding how these percentages were determined follow each of the tables.

Management practices would also reduce ephemeral gully (EG) erosion. Field checks conducted at the Paapaloa Sub-field Office on the island of Hawaii over a period of three years indicate that ephemeral gully erosion is approximately equal to sheet and rill erosion. For example, if sheet and rill erosion is 10 tons/acre/year as measured by the USLE, then ephemeral gully erosion is also 10 tons/acre/year. Use of a 1:1 ratio to estimate EG erosion was discussed with various WNTC specialist and approved for use for FSA planning purposes until further studies are conducted. Ephemeral gully erosion was expressed as an index rather than an actual erosion rate. The EG index was used as a starting point to evaluate reduction in EG erosion due to the application of management and structural-type practices.

Structural practices are installed primarily for ephemeral gully erosion control. Table C on page 36 shows the percent reduction in EG erosion due to structural practices applicable on sugarcane land and Table G on page 55 shows similar information for practices applicable on truck crop land. Documentation regarding how these percentages were determined follow each of the tables.

In instances where structural practices also reduce slope length, it is assumed that these structural practices would also reduce sheet and rill erosion. Table D on page 39 shows the percent reduction in EG erosion due to structural practices applicable on sugarcane land and Table H on page 58 shows similar information for practices applicable on truck crop land. Documentation regarding how these percentages were determined follow each of the tables.

The schematic diagram on the following page outlines the way the overall reduction in sheet and rill (A) erosion and ephemeral gully (EG) erosion was determined.

Reduction in Sheet and Rill Erosion

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BASE Sheet and Rill Erosion Rate

- Reduction Due to Management-type Practices
 - Reduction Due to Structural-type Practices
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= REMAINING Sheet and Rill Erosion Rate

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Reduction in Ephemeral Gully Erosion Index

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BASE Ephemeral Gully Erosion Index

- Reduction Due to Management-type Practices
 - Reduction Due to Structural-type Practices
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= REMAINING Ephemeral Gully Erosion Index

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A dBase III program was developed SCS Hawaii staff to facilitate the development and evaluation of Alternative Conservation Systems (ACS's).

Information about the program is included in Appendix 11.