**NATURAL RESOURCES CONSERVATION SERVICE**

**CONSERVATION PRACTICE STANDARD**

# STRIPCROPPING

**(Ac.)**

**Code 585**

***Stripcropping Layout***

## DEFINITION

Growing planned rotations of erosion-resistant and erosion susceptible crops or fallow in a systematic arrangement of strips across a field.

## PURPOSE

This practice supports one or more of the following purposes:

- Reduce water erosion – Resource Concern (SOIL EROSION - Sheet, rill, & wind erosion )
- Reduce wind erosion – Resource Concern (SOIL EROSION - Sheet, rill, & wind erosion)
- Reduce the transport of sediment and other water and wind borne contaminants – Resource Concerns (Excess nutrients in surface and ground waters and WATER QUALITY DEGRADATION – Pesticides transported to surface and ground waters)
- Protect growing crops from damage by wind-borne soil particles – Resource Concern (DEGRADED PLANT CONDITION – Undesirable plant productivity and health )

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies on cropland.

**CRITERIA**

**GENERAL CRITERIA APPLICABLE TO ALL PURPOSES**

**Arrangement and Vegetative Condition of Strips.** Alternate strips of crops susceptible to erosion with strips of erosion-resistant crops or cover. The orientation of the strips should be at angles as close as practical to perpendicular to the critical wind and water erosion vectors.

**Strip Width.** Use current erosion prediction tool to determine strip width. Plan strip widths to be multiples of the width of the planting equipment. Include effects of other practices in the conservation management system when running the erosion prediction tools.

**Vegetative Cover**. Vegetation in the strips need to consist of crops, forages, specialty crops, or cover crops that will be grown in a planned rotation. At least 50% of the rotation needs to consist of erosion resistant crops or sediment trapping cover in any given year. Erosion resistant strips need to consist of vegetation that reduces erosion to the planned conservation objective. No two adjacent strips can be in an erosion-susceptible condition at the same time during the year. However, two adjacent strips may be in erosion-resistant cover at the same time.

Each adjacent strip needs to follow the designed crop rotation such that the point or year in the sequence of the rotation is staggered or offset to achieve the desired conservation planning objective.

Select vegetative cover that will tolerant the anticipated depth of sediment deposition. Acceptable cover is specified by each specific purpose as stated below.

Avoid or minimize to the extent practical impact to cultural resources, wetlands, and Federal and State protected species during planning, design and implementation of this conservation practice. For more information, see National and Florida NRCS policy, General Manual (GM) Title 420-Part 401, Title 450-Part 401, and Title 190-Parts 410.22 and 410.26; National Planning Procedures Handbook (NPPH, Handbooks Title 180 Part 600) FL Supplements to Parts 600.1 and 600.6; National Cultural Resources Procedures Handbook (NCRPH, Handbooks Title 190 Part 601); and The National Environmental Compliance Handbook (NECH, Handbooks Title 180 Part 610).

**Additional Criteria to Reduce Water Erosion and Associated Transport of Sediment and Other Water-borne Contaminants**

**Number of Strips.** Two or more strips are needed within the conservation planning slope length or "L".

**Alignment of Strips.** Run strip boundaries as parallel to each other and as close to the contour as practical.

**Strip Width.** The width of a strip cannot exceed the critical slope length for contouring.

If a correction strip is required, that strip may vary in width but can be no narrower than the widest working field implement used to traverse the strip.

Where field contours become too sharp to keep machinery aligned with the contour during field operations, establish sod turn-strips on sharp ridge points and or valleys. These strips need to be wide enough to allow the equipment to be lifted and/or turned and meet the same rows across the turn strip.

**Minimum Row Grade**. For condition where ponding is a concern, such as soils with slow to very slow infiltration rates (soil hydrologic groups C or D) or when crops that are sensitive to ponded water conditions for periods of less than 48 hours are being grown, design row grades with positive row drainage of not less than 0.2 percent on slopes.

**Maximum Row Grade.** Do not exceed one-half of the up-and-down hill slope percent used for conservation planning, with a maximum of 4 percent row grade.

Up to a 25% deviation from the design row grade is permitted within 150 feet of a stable outlet.

When the row grade reaches the maximum allowable design grade, establish a new baseline (key line) up or down slope from the last contour line and used for layout of the next contour pattern.

**Headlands/End Rows.** On fields where row crops and tillage are a part of the rotation, maintain headlands/end rows with a slope steeper than the maximum allowable row grade for that field in permanent sod.

**Additional Criteria to Reduce Wind Erosion and Associated Transport of Sediment and Other Wind Borne Contaminants**

**Number of Strips.** Two or more strips within the entire area prone to wind erosion are needed.

**Alignment of Strips.** Run strip boundaries parallel to each other.

**Orientation.** Orient strips as close to perpendicular to the critical wind erosion direction for the susceptible period as practical

**Width of Strips.** The effective strip width is measured along the prevailing wind erosion direction for those periods when wind erosion is expected to occur and for which the system is designed.

When the orientation of erosion-susceptible strips deviates from perpendicular to the prevailing wind erosion direction, adjust the width of these strips correspondingly using current wind erosion prediction technology. To determine how much, see the directions given in the Florida Erosion Control Handbook and in the Wind Erosion section of the National Agronomy Manual (Manuals Title 190 NAM).

**Additional Criteria to Protect Growing Crops from Damage by Wind-borne Soil Particles**

**Strip width**. The effective width shall be measured along the prevailing wind erosion direction during those periods when sensitive crops are susceptible to damage by wind-borne soil particles.

The width of strips shall not exceed the width permitted by the crop tolerance to wind erosion during specific crop stage periods, using current wind erosion prediction technology. Refer to the crop tolerances to wind in the National Agronomy Manual (Manuals Title 190 NAM), in the Florida Erosion Control Handbook, other accepted technical references, or other planned crop protection objectives.

When the orientation of erosion-susceptible strips deviates from perpendicular to the prevailing wind erosion direction, the width of these strips shall be correspondingly adjusted using current wind erosion prediction technology.

**Number of Strips.** A strip cropping system shall consist of two or more strips within the entire area susceptible to wind erosion.

**Alignment of Strips**. Strip boundaries shall run parallel to each other.

**Orientation of Strips:** Strips shall be oriented as close to perpendicular to the prevailing wind erosion direction for the susceptible period as practical.

**CONSIDERATIONS**

Strip cropping may need to be used in combination with other conservation practices to meet the goals of the resource management system.

To improve cropping system diversity and associated benefits, consider a crop rotation at least three years in length including at least three crop species from different plant families.

Wildlife benefits can be enhanced by selecting species and management practices that provide habitat for pollinators, wildlife, and or desired organisms.

Consider delaying mowing on sod turn-strips until after the nesting season. (March 15th – July 15th).

If planning to use a permanent vegetative strip, consider minimizing the use of pesticides and planting pollinator friendly vegetation which offers food and shelter for these species. For pollinator specific plants see Florida NRCS Plant Materials Fact Sheets No. 3 – Planting Native Species for Flower Rich Pollinator Habitat and No. 4 – Developing Planting Mixtures for Pollinator Habitat. For more information on farming for pollinators refer to the www.xerces.org website.

Stripcropping can reduce airborne particulate matter (PM) emissions.

The conservation crop rotation on stripcropped fields should be consistent with the farm enterprise crop mix and/or associated livestock operation. These will influence the proportion of row crops, close growing crops, specialty crops, cover crops, and grass/legume forage crops.

Prior to design and layout, obstruction removal (see Florida NRCS Conservation Practice Standard, Obstruction Removal, Code 500), or changes in field boundaries or shape should be considered, where feasible, to improve the effectiveness of the practice and the ease of performing field operations across the slope.

Prior to layout, inspect the field to find key points for commencing layout or getting a full strip width to pass by an obstruction or ridge saddle. Whenever possible, run the strip boundary parallel with fence lines or other barriers, as long as row gradient criteria are met. Account for access road widths when they must cross the field, and adjust the strip boundary on either side accordingly.

When this practice is used in combination with diversions or terraces (Florida NRCS Conservation Practice Standards Diversion, Code 362, or Terrace, Code 600), coordinate the strip layout with the diversion or terrace grade and spacing so that strip boundaries will parallel terraces wherever possible within the criteria for row grade. Where grass-back or narrow-base terraces are used, allow for the uncropped width along the terrace so that the same strip width is maintained for all strips in the field.

Stable outlets may be necessary where runoff results in concentrated flow erosion. Acceptable stable outlets include grassed waterways, field borders, filter strips, water and sediment control basins, or underground outlets. Acceptable stable outlets include the following Florida NRCS Conservation Practice Standards Grassed Waterways, Code 412; Field Border, Code 386; Filter Strip, Code 393; Water and Sediment Control Basin, Code 638; or Underground Outlet, Code 620, for terraces and diversions.

When the erosion-resistant strip is living vegetation, the species established on non-organic operations, should either be tolerant to herbicides used on the cropped strips or protected from damage by herbicides used on the cropped strips

**PLANS AND SPECIFICATIONS**

Prepare plans and specifications for each field or treatment unit to be strip cropped according to the criteria, considerations, and operations and maintenance described in this standard.

Specifications pertaining to implementation shall be recorded on job sheet or Implementation Requirements documents.

At a minimum, include the following items:

1. Acres of the field
2. Number and width of strips
3. Minimum and maximum row grades
4. Alignment, orientation, and width (for wind erosion)
5. Vegetative cover planned
6. Water erosion prediction results (RUSLE2)
7. Wind erosion prediction (WEPS)

**OPERATION AND MAINTENANCE**

Smooth or remove and distributed over the field sediment accumulations along strip edges as necessary to maintain practice effectiveness.

Mow sod turn-strips at least once a year. Harvesting is optional.

Erosion-resistant strips in rotation shall be managed to maintain the planned vegetative cover and surface roughness.

If the strip alignment is lost due to adjacent strips being in hay or permanent cover, the original strip alignment and width will be re-established as needed.

**REFERENCES**

Foster, G.R. 2004. Draft reference guide, Revised Universal Soil Loss Equation Version 2, (RUSLE2). National Sedimentation Laboratory, Oxford, MS.

Foster, G.R. 2005. Draft science documentation, Revised Universal Soil Loss Equation Version 2, (RUSLE2). National Sedimentation Laboratory, Oxford, MS.

Renard, K.G., G.R. Foster, G.A. Weesies, D.K. McCool, and D.C. Yoder, Coordinators. 1997. Predicting soil erosion by water: A guide to conservation planning with the Revised Universal Soil Loss Equation (RUSLE). U.S. Department of Agriculture, Agriculture Handbook No. 703.

USDA, ARS. 2006. The wind erosion prediction system, (WEPS ver. 1.2.9), User Manual, 2011 Wind Erosion Research Unit, Manhattan, Kans.

USDA-AMS National Organic Program Final Rule 7 CFR Part 205.
http://www.ams.usda.gov/AMSv1.0/nop

USDA-AMS National Organic Program National List of Allowed and prohibited Substances.
http://www.ams.usda.gov/AMSv1.0/nop