

USDA
NATURAL RESOURCES
CONSERVATION SERVICE
MARYLAND CONSERVATION
PRACTICE STANDARD
STRIPCROPPING
CODE 585
(Reported by Acre)

DEFINITION

Growing row crops, forages, small grains, or fallow in a systematic arrangement of equal width strips across a field.

PURPOSES

This practice may be applied for one or both of the following purposes:

1. To reduce sheet and rill erosion;
2. To improve surface water quality by reducing transport of sediment and other water-borne contaminants.

**CONDITIONS WHERE PRACTICE
APPLIES**

This practice applies on sloping cropland. Stripcropping may be applied either on the contour or across the general slope of the land. The effectiveness of this practice is maximized when the strips are as close to the contour as practical.

Stripcropping may not be well suited to fields with undulating or rolling topography because of the difficulty of maintaining parallel crop strip boundaries or staying within row grade limits.

This standard does not apply to situations where narrow erosion-resistant strips will be used in between wider erosion-susceptible strips. For this type of practice, refer to the Maryland conservation practice standard for Contour Buffer Strips, Code 332.

CONSIDERATIONS

Consider the long-term land use objectives of the client and how the implementation and maintenance of this practice will affect those objectives.

Identify and evaluate any constraints such as management options, economic feasibility, access, state and federal regulations, or cost-share program requirements.

Consider the need to protect areas of existing or potential concentrated flow erosion by using other suitable conservation practices, such as grassed waterways, water and sediment control basins, diversions, or terraces.

Prior to layout, determine locations where baselines should be established to assure that crop strips can pass by obstructions, ridge saddles, or other locations that may impact the effectiveness and practicality of the layout.

Consider obstruction removal and changes in field boundaries to improve the effectiveness of stripcropping and the ease of farming, especially to minimize short rows.

Consider equipment operation widths when determining the width of correction areas and the distance between baselines. Strip widths may be adjusted, within the limits of the criteria in this standard, to accommodate widths of farm equipment to minimize partial or incomplete passes.

Within row grade limitations, whenever possible lay out crop strips parallel with fence lines or other barriers. Account for access road widths when they must cross the field, and adjust the strip boundary on either side accordingly.

Consider soil types, drainage characteristics and crop tolerance to wetness. When inadequate drainage poses a potential problem, it may be desirable to lay out a system with row grades closer to the upper range permitted by this standard.

The conservation crop rotation on stripcropped fields should be consistent with the farm

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

enterprise crop mix and/or associated livestock operation. These will influence the proportion of row crops, close growing crops, and meadow crops.

To avoid wide fluctuations in acreage of different crops from year to year, fields with identical crop rotations can be set up that are nearly equal in size and have offset years of rotation commencement. The number of fields needed to produce a nearly constant acreage of each crop for each year in the rotation is equal to one-half of the years in the rotation. Even-year rotation lengths are preferable to odd-year rotation lengths for ease of design.

Consider the need to use stripcropping in combination with other management practices such as Conservation Crop Rotation (Code 328), Contour Farming (Code 330), Residue Management (Codes 329A, 329B, 329C, or 344), Nutrient Management (Code 590), and Pest Management (Code 595) to meet the goals of the conservation management system.

CRITERIA

Criteria Applicable to All Purposes

Number of Strips - A stripcropping system shall consist of two or more strips.

Alignment of Strips - Strip boundaries shall run parallel to each other and as close to the contour as practical.

Alignment of Tillage and Planting Operations - All tillage and planting operations shall follow the established strip line.

Erosion Control - The level of erosion control to be achieved by stripcropping shall meet or exceed the soil erosion level specified by the conservation planning objective. Current erosion prediction technology shall be used to determine the effectiveness of this practice to reduce erosion to acceptable levels. Calculations shall account for the effects of all conservation practices, including management and supporting practices, in the conservation management system.

Critical Slope Length - The critical slope length is the length of slope above which contouring loses its effectiveness. The critical slope length

shall be determined using current erosion prediction technology.

When stripcropping is applied in conjunction with contour farming, the critical slope length is 1.5 times the critical slope length determined for contour farming.

A stripcropping layout shall not occur on a slope longer than the critical slope length unless supported by other practices that reduce slope length below the critical length. Terraces or diversions may be used to reduce the slope length and reduce overland flow velocities. No-till and mulch till practices may be used to increase residue cover, thereby increasing the critical slope length.

Arrangement and Vegetative Condition of Strips - Vegetation in a stripcropping system shall consist of row crops and/or forages grown in a planned rotation. Vegetative cover shall be selected that is adapted to site conditions and tolerant of the anticipated depth of sediment deposition.

Strips susceptible to erosion shall be alternated down the slope with strips of erosion-resistant cover. Erosion-susceptible strips are generally defined as consisting of row crops or fallow with less than 10 percent surface residue cover and little surface roughness during the period of time when erosion potential is the greatest. An erosion-resistant strip generally consists of dense grasses and/or legumes, hay crops nearing the end of the first year, or row crops with surface cover greater than 75 percent during the period of time when erosion potential is the greatest. In conditions where little surface cover is present, surface roughness will be considered erosion-resistant if roughness depressions are at least 7 inches in depth during the period of time when erosion potential is the greatest.

Erosion-resistant strips shall be crops or crop residues that provide the needed protective cover during those periods when erosion is expected to occur. Acceptable protective cover may consist of a growing crop (including grasses, legumes, or grass-legume mixtures), standing stubble, residue with enough surface cover to provide protection, or surface roughness sufficient to provide protection.

When the erosion-resistant strip is in permanent vegetation, the species established shall either be

tolerant to herbicides used on the cropped strips or protected from damage by herbicides used on the cropped strips.

No two adjacent strips shall 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.

Note: In some situations, a field planned for a stripcropping system may already be established in an acceptable permanent cover that can be retained in alternating strips with row crop strips. Under these conditions, lay out the system according to the criteria within this standard and establish the row crop strips. Then follow the operation and maintenance guidelines.

Width of Strips - Base strip widths on the planning objective and on current erosion prediction technology.

Erosion-susceptible strip widths shall not exceed:

1. 50 percent of the slope length (L) used for erosion prediction or 250 feet, whichever is less, where 10-year EI storms are equal to or less than 30; or,
2. 50 percent of the slope length used for erosion prediction or 150 feet, whichever is less, where 10-year EI storm values exceed 30.

The erosion-resistant and erosion-susceptible strips shall be of approximately equal width. If a correction strip is required, that strip may vary in width but shall be no narrower than the widest working field implement used to traverse the strip.

Design and install the strip layout to best facilitate operation of machinery used on the strips. To avoid point rows and partial machine passes, lay out strip widths to have some multiple of full width passes of seeding implements or sprayers.

When this practice is used in combination with diversions or terraces, coordinate the strip layout with the diversion or terrace grade and spacing so that strip boundaries will parallel diversions or terraces wherever possible within the criteria for row grade.

Where field contours become too sharp to keep machinery aligned with the contour during field

operations, establish grassed turn-strips on sharp ridge points. These turn-strips shall 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 - Row grades for soils with slow to very slow infiltration rates (soil hydrologic groups C or D), or for crops sensitive to ponded water conditions for periods of less than 48 hours, shall be designed with positive row drainage of not less than 0.2 percent on slopes where ponding is a concern;

Maximum Row Grade - The row grade shall be aligned as closely as possible to the contour to achieve the greatest erosion reduction, but still be practical to operate equipment. The maximum grade of rows shall not exceed 5 percent, or one-half of the up and down hill slope percent used for erosion prediction, whichever is less.

Headlands or End Rows - On fields where row crops and tillage are a part of the rotation, headlands or end rows with a slope steeper than the maximum allowable row grade for that field shall be maintained in permanent sod or planted using no-till or strip-till residue management.

Minimum Ridge Height - The ridge height shall be designed to reduce soil erosion compared to that of rows oriented up and down the slope. As a minimum, this practice shall be designed to achieve a 0.5 to 2-inch ridge height during the period of the rotation that is most vulnerable to soil erosion. The required ridge height shall be determined using on-site conditions and current erosion prediction technology.

A minimum ridge height is not required for close-grown crops, such as small grains or hay crops, when runoff is reduced compared to that of rows planted up and down the slope. As a minimum, plant height shall be at least 6 inches high and the spacing between plants within the row shall not be greater than 2 inches.

A minimum ridge height is not required where the no-till residue management practice is used, provided that at least 50 percent surface residue is present between the rows after planting.

Stable Outlets - Surface runoff shall be handled by grassed waterways, field borders, filter strips, or other stabilized areas, as appropriate.

Additional Criteria to Reduce Transport of Sediment

Vegetative cover shall be selected that is adapted to site conditions and is tolerant of the anticipated depth of sediment deposition.

A filter strip shall be established at the toe of the slope to reduce sediment leaving the crop field in surface runoff. This filter strip shall be planned and installed according to the Maryland conservation practice standard for Filter Strip, Code 393.

Note: Specific cost-sharing programs or other funding sources may dictate criteria in addition to, or more restrictive than, those specified in this standard.

SPECIFICATIONS

Specifications for installation and maintenance of stripcropping shall be prepared according to the Criteria, Considerations, and Operation and Maintenance described in this standard, and shall be recorded on specification sheets, job sheets, narrative statements in conservation plans, or other acceptable documentation.

All trees, stumps, rocks or similar materials that will interfere with installing the strips shall be removed. The materials shall be disposed of in a manner consistent with maintaining a quality environment and with proper functioning of the buffer strips.

The installed practice shall be checked and documented to verify that it was completed according to the drawings, specifications, and this standard. Documentation shall be in accordance with the section "Supporting Data and Documentation" in this standard.

OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan shall be prepared for the buffer strips. Appropriate Job Sheet(s) may be used to serve as the management plan as well as supporting documentation, and shall be provided to the land user. At a minimum, the following components shall be addressed in the O&M plan, as applicable:

1. Perform all tillage and planting operations parallel to the strip boundaries, except on end rows that have gradients flatter than the criteria set forth in this standard, or where the end rows have at least 75 percent residue cover.
2. Plant correction areas as closely as possible to the contour. Using no-till in the correction areas, or planting close-grown crops rather than open-row crops, increases options.
3. Where sediment accumulates along strip edges, redistribute it over the field as necessary to maintain practice effectiveness.
4. Renovate field borders and other permanently vegetated turn-row areas as needed to maintain at least 65 percent ground cover. Maintain adequate grass widths to allow farm implements room to turn.

SUPPORTING DATA AND DOCUMENTATION

1. Identify resource concern(s) to be treated (refer to the "Purposes" section of this standard);
2. Provide documentation for identified concerns (e.g., soil loss calculations, critical slope length, etc.) as appropriate;
3. Identify the field location and extent of planting in acres, and complete the assistance notes. Also note the location of the planting on the conservation plan map. Assistance notes shall include dates of site inspections, name or initials of the person who made the inspections, specifics as to what was inspected, alternatives discussed, decisions made, and by whom;
4. Soil type;
5. Crop rotation;
6. Design row grade and width of the strips;
7. Operation and Maintenance plan or job sheet.

REFERENCES

1. USDA, ARS, National Soil Erosion Research Laboratory. *Revised Universal Soil Loss Equation, Version 2 (RUSLE2)*.
http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm
2. USDA, Natural Resources Conservation Service. *Maryland Field Office Technical Guide, Section IV, Standards and Specifications*.
3. USDA, Natural Resources Conservation Service. *National Handbook of Conservation Practices*.
4. USDA, Natural Resources Conservation Service. *Revised Universal Soil Loss Equation (RUSLE)*. Maryland Field Office Technical Guide, Section I-D.