

USDA
NATURAL RESOURCES
CONSERVATION SERVICE
MARYLAND CONSERVATION
PRACTICE STANDARD
CONTOUR FARMING
CODE 330
(Reported by Acre)

CONSIDERATIONS

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

Identify and evaluate any constraints such as management options, economic feasibility, 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, consider obstruction removal and changes in field boundaries to improve the effectiveness and ease of contour farming, especially to minimize short rows.

Consider equipment operation widths when determining the width of correction areas and the distance between baselines.

Consider several factors that influence the effectiveness of contour farming for reducing erosion. These factors include the 10-year storm EI_{10} value, ridge height, furrow grade, slope steepness, soil hydrologic group, cover and roughness, and the critical slope length. Cover and roughness, row grade, and ridge height can be influenced by management practices and will provide more or less benefit depending on design.

Ridge height may vary throughout the year as a result of tillage, planting, some harvest operations, row cultivation, and weathering. Use of the ridge height variable may be needed for some fields.

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.

Consider the need to use contour farming in combination with other management practices

DEFINITION

Tillage, planting, and other farming operations performed on or near the contour of the field slope.

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. It is most effective on uniform slopes ranging from 2 to 10 percent, where slope lengths are equal to or less than the critical slope length (i.e., the length of slope above which contouring loses its effectiveness).

This practice will be less effective in achieving the stated purpose(s) on slopes exceeding 10 percent and in areas with 10-year-frequency, single storm EI values greater than 140. (EI = total storm energy x the maximum 30-minute intensity.)

The practice may not be well suited to fields with undulating or rolling topography because of the difficulty of staying within row grade limits.

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

such as Conservation Crop Rotation (Code 328), Residue Management (Codes 329A, 329B, 329C, or 344), Nutrient Management (Code 590), Pest Management (Code 595), and Stripcropping (Code 585) to meet the goals of the conservation management system.

CRITERIA

Criteria Applicable to All Purposes

Erosion Control - The level of erosion control to be achieved by contour farming 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 for contouring shall be determined using current erosion prediction technology.

A contour farming layout shall not be used on hillside slopes that are longer than the critical slope length for contouring, unless supported by other practices that reduce that reduce slope length below the critical length. Terraces or diversions may used to reduce the slope length and reduce overland flow velocities.

Increasing residue cover and roughness will change the vegetative cover-management conditions and decrease overland flow velocities. Increasing roughness alone is not sufficient to reduce the critical slope length. No-till and mulch-till residue management practices may be used to increase residue cover, thereby increasing the critical slope length.

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. The maximum grade of rows shall not exceed 2 percent, or one-half of the up and down hill slope percent used for erosion prediction, whichever is less. Up to 3 percent row grade may be permitted within 150 feet of the approach to a grassed waterway, field border, or other stable outlet.

When the row grade reaches the maximum allowable design grade, a new baseline shall be established up or down slope from the last contour line and used for layout of the next contour pattern. All tillage and planting operations will follow the contour line established.

Headlands or End Rows - Headlands or end rows that are steeper than the maximum row grade criteria stated above shall have 75 to 95 percent ground cover, or shall be established in permanent vegetation.

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 on the contour, provided that at least 50 percent surface residue is present between the rows after planting.

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

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

Plans and specifications for establishment and operation of contour farming 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.

The practice shall be checked and documented to verify that it was completed according to the plan 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 contour baselines or terraces, diversions, or contour buffer strip boundaries where these practices are used, provided the applicable row grade criteria are met;
2. Where terraces, diversions, or contour buffer strips are not present, maintain contour markers on grades that, when followed during establishment of each crop, will maintain crop rows at designed grades. Contour markers may be field boundaries, a crop row left untilled near or on an original contour baseline, or other readily identifiable, continuous, lasting markers. Conduct all tillage and planting operations parallel to the established marker. If a marker is lost, re-establish a contour baseline within the applicable criteria set forth by this standard before seedbed preparation for the next crop;
3. Begin farming operations on the contour baselines and proceed both up and down the slope in a parallel pattern until patterns meet. Where field operations begin to converge between two non-parallel contour baselines, establish a correction area that is either

permanently in grass, established to an annual close-grown crop, or has 75 to 95 percent ground cover.

4. Where contour row curvature becomes too sharp to keep machinery aligned with rows during field operations, establish grass turn strips on sharp ridge points or other odd areas, as needed.
5. 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 practice in acres, and complete the assistance notes. Also note the location of the practice 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. Design row grade;
6. 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.