

USDA  
NATURAL RESOURCES  
CONSERVATION SERVICE  
MARYLAND  
CONSERVATION PRACTICE  
STANDARD

RESIDUE MANAGEMENT;  
RIDGE TILL

CODE 329C  
(Reported in Acres)

**DEFINITION**

Managing the amount, orientation, and distribution of crop and other plant residues on the soil surface year-round, while growing crops on preformed ridges alternated with furrows protected by crop residue.

**PURPOSES**

This practice may be applied as part of a conservation management system to support one or more of the following resource concerns:

- Reduce sheet and rill erosion.
- Reduce wind erosion.
- Maintain or improve soil organic matter content and tilth.
- Modify cool, wet site conditions.
- Provide food and escape cover for wildlife.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to all cropland and other land where crops are grown.

This standard includes tillage and planting methods commonly referred to as ridge till or ridge planting. It does not include bedding or listing operations which bury crop residue.

**CRITERIA**

**General Criteria Applicable to All Purposes**

Following crop harvest and any secondary residue removal, residues shall be maintained until planting with no additional disturbance except for weathering.

Ridge height shall be maintained throughout the harvest and winter seasons by controlling equipment or livestock traffic.

After planting, residues shall be maintained in the furrows until the ridges are rebuilt by cultivation. Ridges shall be rebuilt to their original height and shape during the last cultivation.

Loose residues to be retained on the field shall be uniformly distributed on the soil surface. Cultivation and planting equipment designed to operate on ridges shall be used, such as cultivators equipped with ridging attachments, and planters equipped with ridge planting attachments such as row cleaning devices and guidance systems.

**Additional Criteria to Reduce Sheet and Rill Erosion**

The amount of residue needed and the orientation of ridges in relation to the contour to reduce erosion within the soil loss tolerance (T), or any other planned soil loss objective, shall be determined using the Revised Universal Soil Loss Equation (RUSLE) erosion prediction technology. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount and distribution

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needed. Calculations shall account for the effects of other practices in the conservation management system.

Planting and fertilizer placement shall disturb no more than one third of the row width. Soil and residue removed from the top of the ridge shall be moved into the furrow between the ridges.

After planting, the top of the ridge shall be maintained at least 3 inches higher than the furrow between the ridges. The ridge shall be shaped to prevent erosion along the row by directing runoff to the protected furrow area.

**Additional Criteria to Reduce Wind Erosion**

The amount and orientation of residue needed to reduce erosion within the soil loss tolerance (T), or other planned soil loss objective, shall be determined using current approved wind erosion prediction technology. Partial removal by means such as baling or grazing shall be limited to retain the amount and distribution needed. Calculations shall account for the effects of other practices in the conservation management system.

**Additional Criteria to Maintain or Improve Soil Organic Matter Content and Tilth**

Erosion shall not exceed the soil loss tolerance (T).

The cropping sequence must contain at least 50% perennial crops or 50% high residue producing crops.

Low residue producing crops in the rotation shall be planted using a conservation tillage method that retains a minimum of 50% residue surface cover after planting.

Cover crops shall be used in the crop sequence where prior crop residues after harvest provide less than 50% surface cover.

Partial removal by means such as baling or grazing shall be limited to retain the amount and distribution needed. Calculations shall

account for the effects of other practices in the conservation management system.

Cultivation to rebuild ridges shall be done using tools which maintain residues in the surface layer.

**Additional Criteria to Modify Cool, Wet Site Conditions**

Ridge height prior to planting shall not be less than 6 inches. After planting, the top of the ridge shall be maintained at least 3 inches higher than the furrow between the ridges.

**Additional Criteria to Provide Food and Escape Cover for Wildlife**

Residue height, amount, and time period shall be determined using an approved habitat evaluation procedure. Residues shall not be removed unless it is determined by the habitat evaluation procedure that removal would not adversely affect habitat values. Stubble shall be maintained standing over winter.

## **PLANNING CONSIDERATIONS**

Partial removal of plant residue by such means as baling or grazing may produce negative impacts on resources. The effects of residue removal shall be considered when evaluating the impacts on soil, water, air, plant, and animal resources. These activities should not be performed if the result is excess removal of plant residues.

Ridge till may be practiced continuously throughout the crop sequence, or may be managed as part of a residue management system which includes other tillage and planting methods such as mulch till or No-Till.

Production of adequate amounts of crop residues necessary for the proper functioning of this practice can be enhanced by selection of high residue producing crops and crop varieties in the rotation, use of cover crops, and adjustment of plant populations and row spacing.

This practice can reduce herbicide requirements when used in a conservation management system by providing a choice of weed control methods.

Where improvement of soil tilth is a concern, continuous ridge planting will allow organic material to accumulate in the surface horizon of the soil. Reconstruction of ridges in the same row area year after year will maximize organic matter buildup and biological activity in the row.

Soil compaction may be reduced by controlled traffic, where wheel traffic from all operations is limited to the area between rows or designated traffic areas.

The value of residues for wildlife habitat can be enhanced by leaving rows of unharvested crop standing at intervals across the field.

## **PLANS AND SPECIFICATIONS**

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

## **OPERATION AND MAINTENANCE**

Proper adjustment, operation, and maintenance of equipment is essential for successful implementation of this practice.

Ridge height shall be maintained throughout the harvest and winter season by controlling equipment and livestock traffic.

## **SUPPORTING DATA AND DOCUMENTATION**

1. Identify resource concern(s) to be treated (see **PURPOSES**).
2. Ensure that field location, acreage, crop rotation, ridge height, orientation of ridges, and percent residue needed to address identified resource concern(s) are recorded as needed in the conservation plan.
3. Soil loss calculations if needed.

**REFERENCES**

1. Renard, K.G., G.R. Foster, G.A. Weesies, D.K. McCool, and D.C. Yoder, coordinators. Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE). USDA Agricultural Handbook No. 703, 1997.
2. Maryland RUSLE Manual (FOTG), USDA NRCS, March, 1995.
3. National Handbook of Conservation Practices, USDA Natural Resources Conservation Service.
4. Conservation Research Report No. 41, Crop Residue Management To Reduce Erosion and Improve Soil Quality - Appalachia and Northeast, USDA Agricultural Research Service, Washington, D.C., August, 1995.
5. Lamarca, Carlos Crovetto. Stubble Over the Soil: The Vital Role of Plant Residue in Soil Management to Improve Soil Quality, 1996.
6. National Agronomy Manual, USDA Natural Resources Conservation Service.