

RESIDUE MANAGEMENT, RIDGE TILL (ACRE)

CODE 329C

MONTANA TECHNICAL GUIDE

SECTION IV

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.

PURPOSE

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

- Reduce sheet and rill erosion.
- Reduce wind erosion.
- Maintain or improve soil organic matter content and tilth.
- Manage snow to increase plant available moisture.
- 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 no-till planting on ridges, or bedding, or listing operations, which bury crop residues.

CRITERIA

General Criteria Applicable To All Purposes Named Above.

Following crop harvest and any secondary residue removal, residues shall be maintained until planting with no additional disturbance except for normal 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 row 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 and placement of residue needed, the orientation of ridges in relation to the contour, shall be determined using current approved erosion prediction technology **in order to reduce erosion to within the soil loss tolerance (T) or any other planned soil loss objective (RUSLE 1.05)**. Calculations shall account for the effects of other practices in the conservation management system. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed.

NOTE: This type of font (**AaBbCcDdEe 123..**) indicates NRCS National Standards.
This type of font (**AaBbCcDdEe 123..**) indicates Montana Supplement.

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 during periods when wind erosion is expected to occur, shall be determined using current approved wind erosion prediction technology **in order to reduce erosion to within the soil loss tolerance (T) or any other planned soil loss objective (WEQ Management Period Method)**. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of ridge height, spacing, and direction and of other practices in the conservation management system.

Additional Criteria to Maintain or Improve Soil Organic Matter Content and Tillth

The amount of residue needed to achieve the desired soil condition shall be determined **on a field-by-field basis** using the current approved soil conditioning index procedure (**Agronomy Technical Notes**). Partial removal of residue by means such as baling or grazing shall be limited to retain the amount 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 Manage Snow to Increase Plant Available Moisture

Stubble shall be left standing as high as possible by the harvesting operation, but not less than 6 inches in any case. Stubble shall be maintained standing over winter to trap and retain snow. In cases where the 6-inch stubble height cannot be achieved, ridges shall be oriented not to exceed 45 degrees from perpendicular to the prevailing

wind direction during periods of expected snow cover.

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.

The amount of residue and height of stubble needed to provide cover during winter months shall be determined using an approved **wildlife habitat evaluation procedure—Montana Wildlife Habitat Appraisal Guide**). Residues shall not be removed unless it is determined by the **wildlife habitat evaluation procedure** that removal will not adversely affect habitat values. Stubble shall be maintained standing over winter.

CONSIDERATIONS

Burning of plant residue or excess removal of residue by such means as baling or grazing often produces negative impacts on resources. These activities should not be performed without full evaluation of impacts on soil, water, animal, plants, and air resources.

Ridge till may be practiced continuously throughout some crop sequences, 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. In mixed systems, ridges must be periodically re-established. Selection of acceptable tillage methods for specific site conditions may be aided by an approved Soil Tillage Suitability Rating.

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/or row spacings.

By providing a choice of weed control methods, this practice can reduce herbicide requirements when used in a conservation management system.

Where improvement of soil tilth is a concern, continuous ridge planting will allow organic material to accumulate in the surface horizon. 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 designated rows or traffic areas.

Where ridges direct runoff to areas of concentrated flow, these areas can be protected by grassed waterways, water and sediment control basins, underground outlets, or other suitable practices.

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.

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

As a minimum, a residue management, ridge tillage plan shall include the following information:

- 1. Location map—field numbers and a map or sketch of the area to be established.**
- 2. Extent in acres.**
- 3. Date practice scheduled and applied.**
- 4. Crops to be planted, associated planned residue amounts, percent surface cover, and orientation.**
- 5. Critical time periods to maintain residue**
- 6. Documentation of applied residue in pounds or percent by field or planning unit.**

The Montana Residue Management, Ridge-till Specification is applicable to this practice and is required.

OPERATION AND MAINTENANCE

No operation and maintenance requirements, national in scope, have been identified for this practice.

REFERENCES

USDA–Natural Resources Conservation Service, Field Office Technical Guide (FOTG), Section IV, Practice Standard 645–Upland Wildlife Habitat Management, December 1984.

USDA–Natural Resources Conservation Service, Field Office Technical Guide(FOTG), Section IV, Practice Standard 328–Conservation Crop Rotation, December 1998.

USDA–Natural Resources Conservation Service, *National Agronomy Manual*, Third Edition, Part 503–Crop Production, June 2000.

UNITED STATES DEPARTMENT OF AGRICULTURE
 NATURAL RESOURCES CONSERVATION SERVICE

RESIDUE MANAGEMENT, RIDGE-TILL (ACRE)
CODE 329C

MONTANA CONSERVATION PRACTICE SPECIFICATION

PRODUCER _____

FIELD NO., TRACT, OR CTU _____

SCOPE. This specification provides guidelines to assure the ridge-till systems meet the resource needs and the producer's objectives. The specification is based on the amount and timing of crop residue plus the orientation, height, and width of ridges left on the soil surface.

PURPOSE OF ESTABLISHMENT.

- Reduce water erosion
- Reduce wind erosion
- Other
- Conserve soil moisture
- Manage snow cover for plant available water
- Improve soil quality
- Improve wildlife habitat (food and cover)

TABLE 1. Specifications

TRACT/ FIELD	CROP TO BE PLANTED	PREVIOUS CROP RESIDUE	ORIENTATION STANDING OR FLAT	RIDGE HEIGHT (INCHES)	RIDGE ORIENTATION	POUNDS OF RESIDUE		PERCENT RESIDUE	
						PLANNED	APPLIED	PLANNED	APPLIED

NOTES: If residue is managed for wildlife benefits, describe planned wildlife provisions. Also use this space to describe row direction, grade restrictions, or other site specific requirements.

Soil Conditioning Index (SCI) available and used* Yes No **Calculated SCI Value:** _____

NOTES Concerning Soil Quality:

*SCI provides an indication of the soil condition trend based on planned management. Positive values indicate an upward trend. Negative values indicate a downward trend. The values are based on how crops and management affect soil organic matter content.

