

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD AND SPECIFICATIONS**

RESIDUE MANAGEMENT, RIDGE TILL

(Acre)
CODE 329C

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 with crop residue.

PURPOSES

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

- Reduce sheet and rill erosion.
- Reduce wind erosion.
- 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 tillage or ridge planting. It does not include no till planting on ridges or bedding and listing operations which bury crop residues. Planting and tillage operations generally disturb more of the soil surface than no till or strip till operations.

CRITERIA**General Criteria Applicable to All Purposes**

Loose residues to be retained on the field shall be uniformly distributed on the soil surface. Combines or similar machines used for harvesting shall be equipped with spreaders capable of distributing residue over at least 80 percent of the working width of the header.

Residues shall not be burned.

Following crop harvest and any residue removal operation, 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 traffic and livestock access.

Fertilizer injection and planters shall remove soil and residue from no more than one-fourth of the row width along the ridge top. Residue removed from the top of the ridge shall be moved into the furrow between ridges. After planting, the top of the ridge shall be maintained at least three (3) inches higher than the furrow between the ridges.

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

Cultivators shall be equipped to operate through plant residues without clogging and to move soil to rebuild the ridge.

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

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The number, sequence, and timing of cultivating and planting operations and the selection of ground-engaging components shall be managed to achieve the planned amount, distribution, and orientation of residue after planting and after rebuilding the ridge.

Additional Criteria to Reduce Sheet and Rill Erosion

The amount and orientation of residue needed to reduce erosion within the soil loss tolerance (T) or any other planned soil loss objective shall be determined using current approved erosion prediction technology. Partial removal of residue by means such as winter grazing shall be limited to retain the amount of residue needed for erosion control and to maintain the desired ridge height. Calculations shall account for the effects of other practices used in the conservation system.

Orient ridges along the approximate contour and shape the ridge to shed water to the furrow. Final cultivating operations shall construct a ridge that is a minimum of six (6) inches high at harvest.

Additional Criteria to Reduce Wind Erosion

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

Orient ridges perpendicular to the prevailing winds. Determine the ridge height necessary to reduce wind erosion to acceptable limits.

Additional Criteria to Modify Cool, Wet Site Conditions

Fertilizer injecting or planting equipment shall be adjusted to remove residue from a strip on the top of the ridge with minimal removal of soil while maintaining the ridge height. Keep the operating depth of the equipment working the ridge very shallow. The better drained and warmer strip enhances uniform seed emergence.

Additional Criteria to Provide Food and Escape Cover for Wildlife

Residue height and amount will be managed based on the food and cover required by targeted wildlife species. Residues shall not be removed unless it is determined by a habitat evaluation procedure, Wildlife Habitat Assessment Guide, that residue removal would not adversely affect habitat values and ridge height can be maintained. Stubble shall remain standing over winter.

CONSIDERATIONS

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

Delay grazing until the soil surface has frozen to a depth of two to four inches. Remove livestock when the soil surface begins to thaw.

Ridge till may be practiced continuously throughout the crop sequence or may be managed as part of a residue management system that includes other tillage methods.

Consider the effect of tillage and ridge building activities on the amount and orientation of surface residue when selecting tillage methods. Initial establishment of ridges depletes surface residue needed for erosion protection and wildlife habitat. Consider the use of a cover crop as a means of controlling erosion after the ridges are constructed.

Consider the crop sequence, tillage equipment, and planters needed to initiate a ridge till system. Initial establishment of a ridge till system is recommended following conventional tillage or a low residue no-till crop. Plant the row crop exactly where the rows are needed for future years. Use cultivation operations for the current crop to start building the ridges.

Ridge till is a preferred tillage system for level to gently sloping land (less than 5 percent slopes) where poorly drained soils are usually too wet for early spring tillage.

Production and maintenance of adequate amounts of crop residues necessary for the proper

functioning of this practice can be enhanced by the selection of high residue crops and crop varieties in the rotation, use of cover crops, and adjustments to plant populations and row spacing.

Flat-top or round ridges are desired at planting. Although peaked ridges are easy to make, it is difficult to keep planting equipment centered on the ridge.

Ridge till is suited to wide row spacing. Round or flat-top ridges require a broad base for stability. Narrow tires and proper wheel spacing is necessary on all field equipment.

Ridge till offers a variety of weed control options. The preferred method is to use integrated pest management techniques to identify a need and use either cultivators and/or band apply herbicides to control weeds.

Chaff and straw spreaders are a valuable attachment for all combines particularly when harvesting high residue crops. When combines are equipped with a stripper header, only a chaff spreader is necessary.

Ridge till is better suited for row planted crops in fields that are often too wet in the spring for other tillage methods. A cultivator and special planter adaptations are needed. Consider the wheel spacing of combines and other equipment that will be needed in the field prior to establishing a ridge till system.

Ridge till systems compliment furrow irrigation. Ditching, hilling, or furrowing for irrigation distribution provides suitable ridges for planting the following year.

Leaving rows of unharvested crop standing at intervals across the field can enhance the value of residues for wildlife habitat.

PLANS AND SPECIFICATIONS

Site specifications for establishment and maintenance 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.

Site specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

No specific operation and maintenance requirements have been identified for this practice.

GENERAL SPECIFICATIONS

Procedures, technical details, and other information listed below provide additional guidance for carrying out selected components of this practice.

The estimated residue cover after harvest shall be:

Corn, 30" rows, >120 bushel yield	95%
Corn, 30" rows, 60-120 bushel yield	80%
Corn, silage, 23 ton yield	15%
Cotton	35%
Grain sorghum, harvested for grain	75%
Grain sorghum, silage	15%
Soybeans, 30" rows, 35 bushel yield	70%
Sunflowers, 1400 pounds yield	40%

Estimates of residue cover remaining after grazing, over winter weathering, tilling, or planting operations shall be determined according to the guidelines in the National Agronomy Manual, Part 503, Subpart E. Ridge till residue levels after planting are often 30 to 50 percent but the residue is not evenly distributed. The row middles will have heavy residue while the row area is relatively free of residue.

The line transect method shall be the approved method used to evaluate the percentage of ground surface actually covered by plant residue.

REFERENCES

Conservation Tillage Systems and Management, MWPS-45 Second Edition, 2000.