

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

**RESIDUE AND TILLAGE MANAGEMENT
RIDGE TILL**

(Ac.)

CODE 346

DEFINITION

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

PURPOSE

- Reduce sheet and rill erosion
- Reduce wind erosion
- Maintain or improve soil quality
- Reduce energy use
- 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.

This practice 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 that bury crop residues.

CRITERIA

General Criteria Applicable to All Purposes

Following crop harvest, leave residue on the surface until planting with no additional disturbance except for normal weathering.

Maintain ridge height throughout the harvest and winter seasons by controlling equipment or livestock traffic.

After planting, maintain residues in the furrows until the ridges are rebuilt by cultivation. Rebuild ridges to their original height and shape during the last row cultivation.

Stable Outlets. A stable outlet must exist where ridges direct runoff to areas of concentrated flow.

Maximum Row Grade. Row grades shall not exceed 9%.

If irrigation is used with this practice, row grades shall not exceed 7%. Where residue cover is less than 30%, row grade shall not exceed 7%.

Additional Criteria to Reduce Sheet and Rill Erosion.

Move soil and residue removed from the top of the ridge into the furrow between the ridges.

After planting, maintain the top of the ridge at least 3 inches higher than the furrow between the ridges.

Shape the ridge top to direct runoff to the protected furrow area.

When used in a system to reduce sheet and rill erosion the critical slope shall not exceed lengths determined using the current approved water erosion prediction technology.

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

Additional Criteria to Reduce Wind Erosion

Ridges shall be designed using current wind erosion prediction model and must account for the effects of ridge height, spacing, and orientation to the direction of erosive winds.

The amount and orientation of residue needed and the amount of surface soil disturbance allowed to reduce wind erosion to the tolerable soil loss value (T) or other soil loss objective shall be determined using the current approved wind erosion prediction technology. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Maintain or Improve Soil Quality

An evaluation of the cropping system using the current approved soil conditioning index (SCI) procedure must result in a positive trend. Calculations shall account for the effects of other practices in the conservation management system.

Rebuild ridges using cultivation tools that maintain residues in the surface layer.

Additional Criteria to Reduce Energy Use

Ensure the Soil Tillage Intensity Rating (STIR) for the single crop establishment and harvest is less than or equal to 42.

Additional Criteria to Manage Snow to Increase Plant-Available Moisture

During the time that significant snowfall is expected to occur, maintain minimum distance between the bottom of the furrow and the top of the stubble as follows:

- At least 10 inches for crops with a row spacing of less than 15 inches;
- At least 15 inches for crops with a row spacing of 15 inches or greater.

If this minimum distance cannot be achieved, orient ridges so as not to exceed 45 degrees from perpendicular to the prevailing wind direction during periods of expected snowfall.

Additional Criteria to Modify Cool Wet Site Conditions

Ridge height prior to planting shall be at least 6 inches.

Additional Criteria to Provide Food and Escape Cover for Wildlife

Determine residue duration, amount, orientation, and stubble height needed to provide adequate food and cover for target species using an approved habitat evaluation procedure.

CONSIDERATIONS

General - Removal of residue, such as by bailing or grazing, can have 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 that 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 population and/or row spacing.

Alignment of ridges on the contour will aid management of runoff and sheet and rill erosion.

Since row cultivation is typically used for weed control and to reform ridges, this practice has the potential to reduce herbicide requirements.

A field border planted to permanent vegetation can assist in unobstructed turning, elimination of end rows, providing travel lanes for farming

operations, and can provide habitat for beneficial insects and pollinators.

When providing technical assistance to organic producers, residue management, and tillage activities should be consistent with the USDA-Agricultural Marketing Service National Organic Program standard.

Maintaining or Improving Soil Condition and Reducing CO₂ Loss from the Soil -

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.

CO₂ loss is directly related to the volume of soil disturbed, the intensity of the disturbance and the soil moisture content and soil temperature at the time the disturbance occurs.

- Shallow soil disturbance (1-3 inches) releases less CO₂ than deeper operations.
- When deep soil disturbance is performed, such as by subsoiling or fertilizer injection, make sure the vertical tillage slot created by these implements is closed at the surface.
- Planting with a single disk opener no-till drill will release less CO₂ than planting with a wide-point hoe/chisel opener air seeder drill.
- Soil disturbance that occurs when soil temperatures are below 50 degrees F will release less CO₂ than operations done when the soil is warmer.

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

Providing Food and Escape Cover for Wildlife – Avoid disturbing standing stubble or heavy residue during the nesting season for ground-nesting species.

Foregoing fall shredding or tillage operations will maximize the amount of wildlife food and cover during critical winter months.

Leaving rows of unharvested crop standing at intervals across the field or adjacent to permanent cover will enhance the value of residues for wildlife food and cover. Leaving unharvested crop rows for two growing seasons will further enhance the value of these areas for wildlife.

PLANS AND SPECIFICATIONS

Plans and specifications shall include:

- field number and acres
- purposes(s) for this practice
- crops where this practice will be used
- the type and timing of soil disturbing operations
- estimated surface residue following each operation.

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

OPERATION AND MAINTENANCE

Evaluate/measure the crop residues cover and orientation and ridge height for each crop to ensure the planned amounts and orientation are being achieved. Adjust management as needed to either plan a new residue amount or orientation; or adjust the planting, tillage/cultivation, or harvesting equipment.