

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

RESIDUE MANAGEMENT, NO TILL/STRIP TILL

(Acre)

CODE 329A

DEFINITION

Managing the amount, orientation and distribution of crop and other plant residues on the soil surface year-round, while growing crops in narrow slots, or tilled or residue-free strips in soil previously untilled by full-width inversion implements

PURPOSES

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
- Conserve soil moisture
- Manage snow to increase plant available moisture or reduce plant damage from freezing or desiccation
- 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 no till, zero till, slot plant, row till, zone till or strip till.

CRITERIA

General Criteria Applicable to All Purposes Named Above

Loose residues to be retained on the field shall be uniformly distributed on the soil surface.

Where combines or similar machines are used for harvesting, they shall be equipped with spreaders capable of distributing residue over at least 80 percent of the working width of the header.

Planters or drills shall be equipped to plant directly through untilled residue or in a tilled seedbed prepared in a narrow strip along each row by planter attachments such as rotary tillers, sweeps, multiple coulters, or row cleaning devices.

Residues shall not be burned or disturbed by full-width tillage operations except as follows.

Seedbed preparation, planting, and fertilizer placement shall disturb no more than one-third of the row width. The row area formed by the planting operation shall be level with or slightly above the adjacent row middles, unless rows are planted on the contour.

If row cultivation or spot treatment for weed escapes, leveling ruts or similar operations becomes necessary, limit tillage to undercutting operations which minimize burial of surface residue.

Additional Criteria to Reduce Sheet and Rill Erosion

The amount of randomly distributed flat residue needed 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, Version 2 (Rusle 2). Partial removal of residue by means such as baling or grazing shall be limited to retain the amount of residue needed to reduce erosion. Calculations shall account for the effects of other practices in the conservation management system.

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 the Excel Wind Erosion Equation, Colorado Field Version. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount of residue needed to reduce erosion.

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

Additional Criteria to Maintain or Improve Soil Organic Matter Content

The amount of residue needed to achieve the desired soil condition shall be determined using the Revised Universal Soil Loss Equation, Version 2 (Rusle 2), Soil Conditioning Index. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount of residue needed. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Conserve Soil Moisture

A minimum quantity of 50 percent residue cover shall be maintained throughout the year. Residue shall be evenly distributed and maintained on the soil surface. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount of residue needed.

Additional Criteria to Manage Snow to Increase Plant Available Moisture or Reduce Plant Damage From Freezing or Desiccation

Stubble shall be left standing as high as possible by the harvesting operation, but not less than 6 inches in any case. Stubble shall remain standing over winter to trap and retain snow. Loose residue may be removed, providing that the remaining residue is left standing.

When crops are planted in the fall, the width of the tilled strip or slot shall be no more than one-third of the row width to decrease disturbance to standing stubble.

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.

Do not remove residues unless the habitat evaluation procedure indicates removal will not adversely affect habitat values.

CONSIDERATIONS

No till or strip till may be practiced continuously throughout the crop sequence, or may be managed as part of a system which includes other tillage and planting methods such as mulch till. Soil Tillage Intensity Ratings are included in the Rusle 2 Soil Conditioning Index.

Production of adequate amounts of crop residue can be enhanced by selection of high residue-producing crops, use of cover crops, and adjustment of plant populations and row spacing.

Maintaining a continuous no till system will maximize the improvement of soil organic matter content. Also, when no till is practiced continuously, soil reconsolidation provides additional resistance to sheet and rill erosion.

The effectiveness of stubble to trap snow or to reduce plant damage from freezing or desiccation increases with stubble height.

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

PLANS AND SPECIFICATIONS

Prepare plans and specifications for establishment and operation of this practice for each field or treatment unit according to the Criteria, Considerations and Operation and Maintenance sections of this standard. Specifications shall describe the requirements for applying this practice to meet the intended purpose.

Record practice specifications on the Colorado Residue Management, No Till/Strip Till, 329A Conservation Practice Job Sheet.

OPERATION AND MAINTENANCE

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

REFERENCES

Colorado Field Office Technical Guide, Section I. Agronomy Technical Note No. 81. 1992. Residue Cover as Affected By Tillage. USDA, Natural Resources Conservation Service. Lakewood, CO.

Colorado Field Office Technical Guide, Section I. Agronomy Technical Note No. 79 (rev. 2). 1992. Crop Residue Production and Management for Resource Protection. USDA, Natural Resources Conservation Service. Lakewood, CO.

Revised Universal Soil Loss Equation, Version 2, 2004. USDA NRCS, Washington DC.
http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm

Colorado Field Office Technical Guide, Section I, Erosion Prediction, Excel Wind Erosion Equation (WEQ) Colorado Guidance Document. 2003. USDA, NRCS, Lakewood, CO.
http://efotg.nrcs.usda.gov/references/public/CO/CO_Excel_WEQ_Guidance.pdf