

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

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 in 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 system to support one or more of the following:

- Reduce sheet and rill erosion.
- Reduce wind erosion.
- Maintain or improve soil organic matter content.
- Conserve soil moisture.
- 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**

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.

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 (1/3) of the row width. The row area created by the planting operation shall be level or slightly above the adjacent row middles unless the rows are planted on the contour.

If row cultivation or spot treatment for weed escapes, leveling ruts, or similar operations become necessary, tillage shall be limited to undercutting operations which minimize burial of surface residues.

Additional Criteria to Reduce Sheet and Rill Erosion or 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

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329A-2

determined using current approved erosion prediction technology. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount of residue needed for erosion control. Calculations shall account for the effects of other practices used in the conservation 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 current approved soil conditioning index procedure. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed for the desired soil condition. Calculations shall account for the effects of other practices in the conservation 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 minimum amount needed to conserve soil moisture.

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 the 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.

CONSIDERATIONS

No till or strip till may be applied continuously throughout the crop sequence or may be managed as part of a system which includes other tillage and planting methods. Select acceptable tillage methods for specific site conditions and long term sustainability of the soil resource.

Maintaining a continuous no till system will maximize the improvement to soil organic matter content and soil quality parameters. Soil carbon can be increased with continuous no till and strip

till farming methods. When no till is practiced continuously, soil consolidation provides additional resistance to sheet and rill erosion.

Production 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, use of cover crops, and adjustments to plant populations and row spacing.

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

Fertilizer placement below the soil surface with knives or point injection is desired for availability of nitrogen, phosphorus, and potassium. Surface applications of fertilizers may result in stratification of phosphorus and potassium in the top 2 inches of soil and losses of ammonia nitrogen to volatilization.

The effectiveness of stubble to trap snow or reduce plant damage from freezing or desiccation increases with stubble height. A minimum stubble height of 6 inches is desired. Patterns of variable stubble heights may be created to further increase snow storage.

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%
Forage crop, after cutting	35%
Forage crop, after regrowth	85%
Grain sorghum, harvested for grain	75%
Grain sorghum, silage	15%
Winter small grain, 50 bushel yield	85%
Spring small grain, 40 bushel yield	80%
Soybeans, 30" rows, 35 bushel yield	70%
Soybeans, drilled, 40 bushel yield	75%
Sunflowers, 1400 pounds yield	40%
Rice	60%

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.

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.