# NATURAL RESOURCES CONSERVATION SERVICE
# CONSERVATION PRACTICE STANDARD

# RESIDUE MANAGEMENT, NO TILL/STRIP TILL
# (Acres)
# 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:

- Reduce sheet and rill erosion
- Maintain or improve soil quality
- 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, 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 sweeps or multiple coulters, or in a narrow strip where residues have been removed by row cleaning devices.

Residues shall not be disturbed 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.

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 residue

and the extent of the tillage shall will be limited to the problem areas.

**Additional Criteria to Reduce Sheet and Rill Erosion**

The amount of surface residue needed at planting time to meet the planned soil loss objectives, shall be determined using the Revised Universal Soil Loss Equation (RUSLE).

Partial removal of residue or crop growth shall be limited to retain the amount needed to achieve the desired objective.

**Additional Criteria to Maintain or Improve Soil Quality and to Conserve Soil Moisture**

Maintain a minimum of 50% surface cover by crop residues throughout the year. Residue shall be evenly distributed and maintained on the soil surface.

The amount of biomass needed to achieve the desired objective shall be determined using the current soil conditioning index.

Partial removal of residue or crop growth shall be limited to retain the amount needed to achieve the desired objectives.

Cover crops planted specifically for soil improvement may be harvested or grazed, if adequate biomass is retained or other biomass is added to achieve the desired level of soil organic matter.

**Additional Criteria to Provide Food and Cover for Wildlife**

Crop residues shall be managed to provide food and/or cover for the targeted wildlife species. Use an appropriate wildlife habitat evaluation procedure as needed.

## CONSIDERATIONS

No-till or strip till is encouraged to be practiced continuously throughout the crop sequence, or may be managed as part of a system that includes other tillage and planting methods.

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, adjustment of plant population, narrowing row spacings and minimizing tillage operations.

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

Strip or zone tillage is especially applicable on cool wet soils and also may be an excellent technology to use when transitioning from full tillage to no-till.

The effectiveness of stubble to trap snow and reduce plant damage from freezing 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

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 329A, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

Selection of no-till, zone till or other planting equipment and attachments will be based on the following:

Soil drainage

Soil texture

Soil condition (health)

Cropping system

Available equipment

Desired level of surface residue

Planting equipment (drills and planters) must be well maintained and properly adjusted.

Required residue levels will be documented.

## REFERENCES

1. Better Soils Better Yields Conservation Technology Information Center 2002
2. Lamarca, Carlos Crovetto. “Stubble over the Soil” American Society of Agronomy 1996
3. National Agronomy Manual, USDA Natural Resources Conservation Service
4. Conservation Research Report No. 41, Crop Residue Management To Reduce Erosion and Improve Soil Quality – Appalacia and Northeast, USDA, Agricultural Research Service, Washington D. C., August 1995.
5. Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil loss Equation (RUSLE). USDA Agricultural Handbook No. 703, 1997.

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