

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**RESIDUE MANAGEMENT, NO TILL AND STRIP TILL**

(Acre)  
CODE 329A

**DEFINITION**

Managing the amount, orientation and distribution of crop and other plant residue on the soil surface year-round, while growing crops in narrow slots or tilled strips in previously untilled soil and residue.

**PURPOSES**

This practice may be applied as part of a conservation management system that meets the social and economic objectives of the producer and supports the following purposes, as applicable:

- \* Reduce sheet and rill erosion.
- \* Reduce wind erosion.
- \* Maintain or improve soil organic matter content and tilth.
- \* 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, or strip till.

**CRITERIA****General Criteria Applicable to All Purposes Named Above**

Loose residue 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.

Residue shall not be burned, or disturbed by full width tillage operations.

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.

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.

Pesticides used shall be registered and applied according to the label and other Federal, state and local requirements.

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

The amount of residue needed to reduce erosion to the soil loss tolerance (T) or any other planned soil loss objective, shall be determined using current approved erosion prediction technology (RUSLE). Partial removal of residue by means such as baling or grazing, shall be limited to retain the amount needed. Calculations shall account for the effects of other practices or tillage operations in the conservation management system.

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Seedbed preparation, planting, and fertilizer placement shall disturb no more than one fourth of the row width. The planted row area shall be level with, or higher than adjacent row bottoms unless the rows are planted on the contour.

### **Additional Criteria to Reduce Wind Erosion**

The amount and orientation of residue needed to reduce erosion to the soil loss tolerance (T) or other planned soil loss objective shall be determined using current approved wind erosion prediction technology. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices or tillage operations 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 current approved soil conditioning rating indices procedure. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices or tillage operations 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 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 be maintained standing over winter to trap and retain snow.

When crops are planted in the fall, the width of the tilled strip or slot shall be no more than one fourth of the row width, in order to reduce the disturbance of 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. Residue shall not be removed unless it is determined by the appropriate NM Wildlife Habitat Evaluation Guides that removal would not adversely affect habitat values.

## **CONSIDERATIONS**

To plan crop residue management systems for erosion control or other conservation purposes requires a general working knowledge of the degree to which tillage and other field implements bury crop residue, and how much residue is likely to remain on the surface after a single pass of that implement. For guidance, refer to Table 3.

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.

These residue management systems generally require more intensive management than conventional tillage systems. More precision is required in placement of fertilizer. An example of this is avoiding injury to the seedling when injecting fertilizer near the seed zone. Often the weed species composition shifts to other annuals or perennials that were not typically found in the conventional system. Insect control methods may need to be changed due to the increased surface residue. Improved water infiltration rates and the increased surface residue may reduce the length of surface irrigation runs. Soils may warm up slower in the spring.

Residue management systems generally increase infiltration rates, reduce surface evaporation, reduce on-farm power and energy requirements, reduce compaction, and improve water use efficiency.

Production of adequate amounts of crop residue 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 populations and row spacings.

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

No till planting of spring crops into chemically killed annual cover crops is an effective way to control wind erosion on irrigated cropland.

The effectiveness of stubble to trap snow or reduce plant damage from freezing or desiccation increases with stubble height. Variable height stubble patterns may be created to further increase snow storage.

The value of residue for wildlife habitat can be enhanced by leaving rows of unharvested crop standing at intervals across the field.

#### **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 sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

#### **OPERATION AND MAINTENANCE**

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

1. Special considerations for Pest Management:
  - a. Special precautions must be taken to ensure that perennial weeds such as bindweed, johnsongrass and blueweed are not allowed to build up.
  - b. Appropriate actions must be taken as needed for insect control, particularly around field boundaries, fences or other infectious sites.
2. Special attention is needed to ensure that eroded areas are repaired in a timely manner.
3. Proper operation and maintenance of equipment is needed to enhance this practice.