

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

RESIDUE AND TILLAGE MANAGEMENT  
MULCH TILL

(Acre)  
Code 345

**DEFINITION**

Managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting the soil-disturbing activities used to grow crops in systems where the entire field surface is tilled prior to planting.

**PURPOSE**

- ◆ Reduce sheet and rill erosion.
- ◆ Maintain or improve soil condition.
- ◆ Increase plant-available moisture.
- ◆ Provide food and escape cover for wildlife.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to all cropland and other land where crops are planted.

This practice includes tillage methods commonly referred to as mulch tillage or chiseling and disking. It applies to stubble mulching on summer-fallowed land, to tillage for annually planted crops and to tillage for planting perennial crops.

It also includes some planting operations, such as hoe drills, air seeders and "no-till" drills that disturb a large percentage of the soil surface during the planting operation.

**CRITERIA**

**General Criteria Applicable to All Purposes**

All residues shall be uniformly distributed over the entire field. Residue shall not be burned.

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

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

**Additional Criteria to Maintain or Improve Soil Condition**

An evaluation of the cropping system using the current approved soil conditioning index procedure shall result in a positive trend.

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#) or visit the [electronic Field Office Technical Guide](#).

### **Additional Criteria to Increase Plant-Available Moisture**

**Reducing Evaporation from the Soil Surface.** A minimum of 2000 pounds per acre or 60 percent surface residue cover shall be maintained throughout the year.

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

The time that residue is present, the amount and orientation of residue and the height of stubble needed to provide adequate food and cover for the target species shall be determined using an approved habitat evaluation procedure.

Harvest or tillage operations that disturb or cover the entire field shall not be performed during the nesting and brood-rearing period of the target species.

### **CONSIDERATIONS**

**General** - Removal of crop residue, such as by baling or grazing, can have a negative impact on resources. These activities should not be performed without full evaluation of impacts on soil, water, animal, plant and air resources.

Mulch till may be practiced continuously throughout the crop sequence, or may be managed as part of a residue management system that includes other tillage methods such as no till. 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 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 spacing.

A field border planted to permanent vegetation can:

- Allow unobstructed turning for equipment.
- Eliminate unproductive end rows.
- Provide food and escape cover for wildlife.
- Provide travel lanes for farming operations.

**Increasing Soil Organic Matter Level and Reducing CO<sub>2</sub> Loss from the Soil** – Where improving soil tilth is a concern, use of undercutting tools will enhance accumulation of organic material in the surface layer.

CO<sub>2</sub> 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. The following guidelines can make this practice more effective:

- Shallow soil disturbance (1-3 inches) releases less CO<sub>2</sub> 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 CO<sub>2</sub> than planting with a wide-point hoe/chisel opener air seeder drill.

**Increasing Plant-available Moisture** – Tillage and planting operations done on the contour will help slow overland flow and increase infiltration, thus increasing the potential for increased water storage in the root zone.

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

Forgoing 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**

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations and O&M described in this standard. Specifications shall be recorded using approved specification sheets, job

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

The following should be specified for residue management use: 1) The critical erosion period, which the crop residue must be present. 2) The amount of crop residue, orientation and distribution that must be present to meet the planned response. 3) Estimate percentage of ground cover or measure actual residue cover using the line transects method.

### **OPERATION AND MAINTENANCE**

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

### **REFERENCES**

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