

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
RESIDUE AND TILLAGE MANAGEMENT
NO TILL/STRIP TILL/DIRECT SEED

(Ac.)

CODE 329

DEFINITION

Managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities to only those necessary to place nutrients, condition residue and plant crops.

PURPOSE

1. Reduce sheet and rill erosion.
2. Improve soil organic matter content.
3. Reduce CO₂ losses from the soil.
4. Increase plant-available moisture.
5. 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 planting methods commonly referred to as no-till, strip till, direct seed, zero till, slot till or zone till. Approved implements include: no-till and strip-till planters; certain drills and air seeders; strip-type fertilizer and manure injectors and applicators; in-row chisels; and similar implements that only disturb strips or slots. All others are considered to be full-width or capable of full disturbance and therefore are not compatible.

CRITERIA

General Criteria Applicable to All Purposes

Residue shall not be burned.

All residues shall be uniformly distributed over the entire field and maintain at least a 30% ground cover.

No full-width tillage shall be performed regardless of the depth of the tillage operation.

The annual Soil Tillage Intensity Rating (STIR) value for all soil-disturbing activities shall be no greater than 30.

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 erosion to the planned soil loss objective 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 Improve Soil Condition

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

Additional Criteria to Reduce CO₂ Loss from the Soil

The annual Soil Tillage Intensity Rating (STIR) value for all soil-disturbing activities shall be no more than 20.

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

Additional Criteria to Increase Plant-available Moisture

Reducing Evaporation from the Soil Surface. The annual Soil Tillage Intensity

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Rating (STIR) value for all soil-disturbing activities in the cropping system shall be no more than 20.

Additional Criteria to Provide Food and 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 the Louisiana Wildlife Habitat Evaluation for Resource Management Systems.

CONSIDERATIONS

General.

Removing 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.

Follow NRCS policy on cultural resources.

Production of adequate amounts of crop residues necessary to achieve the purposes 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.

Using no till/strip till/direct seed for all crops in the rotation or cropping system can enhance the positive effects of this practice by:

- increasing the rate of soil organic matter accumulation.
- keeping soil in a consolidated condition, which provides additional resistance to sheet and rill erosion.
- sequestering more carbon in the soil.
- further reducing the amount of particulate matter generated by field operations.
- forming root channels and other near-surface voids that increase infiltration.

Increasing Soil Organic Matter Level and Reducing CO₂ Loss.

CO₂ 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 CO₂ than deeper operations.
- When deep soil disturbance is performed, such as by subsoiling or fertilizer injection, make sure the vertical slot created by these implements is closed at the surface.
- Planting with a single disk opener no-till drill will release less CO₂ than planting with a wide-point hoe/chisel opener air seeder drill.
- Soil disturbance that occurs when soil temperatures are below 50° F will release less CO₂ than operations done when the soil is warmer.

Managing Soil Moisture and Protecting Crops from Freeze Damage.

The type, timing and depth of soil-disturbing activities all influence moisture loss. Shallow operations (1-2 inches) or operations that do not invert the soil will reduce moisture loss compared to deeper operations or those that invert and mix the soil.

Soil-disturbing operations performed when the soil surface is moist will result in greater moisture loss than operations done when the top two to three inches of soil have dried.

Performing all field operations on the contour will slow overland flow and allow more opportunity for infiltration.

Wildlife Food and Cover.

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.

Leave crop residues undisturbed after harvest (do not shred or roll) to maximize their cover and food source benefits.

Avoid disturbing standing stubble or heavy residue during the nesting season for ground-nesting species.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria and Considerations 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

All pesticides used in no till/strip till/direct seed systems shall be labeled for their intended use and be recommended by the LSU Agricultural Center.

Mechanical cultivation for weed control; shall be limited to emergency situations and tillage shall be limited to undercutting operations which minimize burial of surface residue.

Tillage necessary to level ruts or perform deep tillage (subsoiling/chiseling) operations shall be performed in such a manner that a minimum of 30 percent cover of crop and other plant residue shall be left on the soil surface year around.

Information concerning soil disturbance, retention, and burial of residue by various tillage implements can be found in the [National Agronomy Manual](#) or in the operations files contained in the Revised Universal Soil Loss Equation (RUSLE 2) erosion prediction model.

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