

NATURAL RESOURCES CONSERVATION SERVICE
MONTANA CONSERVATION PRACTICE SPECIFICATION

RESIDUE AND TILLAGE MANAGEMENT
NO TILL/STRIP TILL/DIRECT SEED (ACRE)

CODE 329

PRODUCER

TRACT / FIELD NUMBER / CTU

ACRES

SCOPE: Residue management systems can be designed to accomplish one or more of the following:

- Reduce sheet and rill erosion
- Reduce wind erosion
- Improve soil organic matter content
- Reduce CO₂ losses from the soil
- Reduce soil particulate emissions
- Increase plant-available moisture
- Provide food and escape cover for wildlife.

No till, strip till, and direct seeding are similar systems that can be described as managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year around, while growing crops in narrow slots or tilled strips in previously undisturbed residue.

No till and direct seed systems leave residue undisturbed from harvest through planting except for narrow strips that cause minimal soil disturbance, such as injecting anhydrous ammonia. No till is also referred to as zero tillage, slot till, direct seeding, or slot plant.

Strip till systems often leave residue undisturbed from harvest through planting except for strips up to a third of the row width. These strips are cleared of residue or tilled for warming and drying purposes either before or during the planting operation. This practice is also referred to as row till, zone till, or fall strip till.

CONSERVATION MANAGEMENT SYSTEMS

No till/strip till/direct seed residue management systems are established as a component of a resource management system. Crop rotation, pest management, nutrient management, various structures, and buffer practices are used in resource management planning to address natural resource concerns identified during the planning process.

PRACTICE SPECIFICATIONS

Practice specifications are provided to assure the residue management system meets the resource needs and producer's objectives. The specifications are based on the amount, timing, and orientation of crop residue left on the soil surface. These planned requirements are recorded on the job sheet in Table 1. Supporting information is included in Tables 2 and 3.

GENERAL SPECIFICATIONS

APPLICABLE TO ALL PRACTICE PURPOSES

- Residue to be retained on the field must be uniformly distributed. Combines or other harvesting machines must be equipped with spreaders capable of distributing residue over at least 80 percent of the combine header width.
- Secondary removal of crop residue by baling or grazing is limited in order to retain the amount of residue needed to achieve the intended purpose(s).
- Residue shall not be burned or distributed by full width tillage operations except for harrows designed to spread straw and germinate weeds with no soil disturbance.
- Planting implements should be equipped with coulters, knives and/or disk openers designed to cut through surface residue.

Specification MT329-2

- Row disturbance from harvest through planting by nutrient injection, row cleaning, planting, or other operations will be minimal.
- Row cleaners may be attached to the planters to move residue out of the row area to help warm and dry the seedbed.
- Anhydrous injectors, manure injectors, and similar equipment may need to be modified to operate in high residue situations.
- Weed control techniques must be carefully planned and monitored, yet sufficiently flexible, to compliment the system.
- Nutrient management must be carefully designed and monitored on a regular basis to optimize production and minimize potential non-point source pollution.

ADDITIONAL SPECIFICATIONS

APPLICABLE TO PURPOSES IDENTIFIED DURING PLANNING

Reduce erosion from wind and water

- On sloping ground where water erosion is a concern, the row area formed during the planting operation shall be level with or above the row middles unless planting is on the contour (see Table 1 notes).
- The required amount, timing, and orientation of residue will be in accordance with site-specific data recorded in Table 1. Current wind and water erosion prediction technology will be used to establish minimum requirements that take into consideration supporting practices.

Improve soil organic matter content

Maintaining adequate amounts of crop residue on the soil surface, minimized soil disturbing tillage practices, and proper nutrient management all factor into improving soil organic matter which is a good indicator of over all soil health. Utilization of the soil conditioning index procedure must result in a positive trend (see Table 1).

Tillage aerates the soil and increases crop residue decomposition. No till and strip till protect the soil from excessive erosion, reduce soil aeration from tillage, allow soil organic matter to accumulate, and improve the condition and health of the soil. The required amounts of residue for soil protection are specified in Table 1. Table 2 and 3 can be used to plan and record the crops, field operations, and management necessary to achieve a positive trend in soil organic matter content.

Reduce CO₂ loss from the soil

- The release of environmentally harmful carbon dioxide into the atmosphere is caused by excess tillage. The annual Soil Tillage Intensity Rating (STIR) value for all soil-disturbing activities shall be no more than 20.

Increase plant available moisture

- Residue shall be evenly distributed and maintained on the soil surface to retain soil moisture for crop use by enhancing infiltration and reducing evaporation. A minimum of 50 percent surface cover is required to significantly reduce surface evaporation.
- Crop stubble height during the time evaporation is expected to occur should be at least 10 inches for crops with row spacing of less than 15 inches and at least 15 inches for crops with a row spacing of 15 inches or greater. Stubble heights shall be present on at least 60 percent of the field.
- To add soil moisture by trapping snow, crop stubble height going into the winter months should be at least 10 inches for crops with a row spacing of less than 15 inches and at least 15 inches for crops with a row spacing of 15 inches or greater. For best results, these stubble heights should be present on at least 50 percent of the field.

Provide food and cover for wildlife

The amount of residue, height of stubble, and when residue needs to be present to meet the minimum needs of the target wildlife species are specified in Table 1. The Montana Habitat Evaluation procedure is used to determine appropriate amounts of residue.