

Residue Management, No Till and Strip Till

(Acre)
Code 329A

Natural Resources Conservation Service
Conservation Practice Standard

I. 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 strips in previously untilled soil and residue.

II. Purposes

This standard may be applied as part of a conservation management system to reduce inter-rill, rill, and wind erosion.

III. Conditions Where Practice Applies

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

This practice includes tillage and planting methods commonly referred to as no till, row till, slot plant, strip till, zero till, or zone till.

IV. Criteria

- A. Residue which is to be retained on the soil surface, shall be uniformly distributed over at least 80% of the equipment harvesting width. Planned amounts shall be maintained from harvest until after planting.
- B. Residues shall not be burned or disturbed by full width tillage operations. Strip till operations shall minimize the burial of surface residue.
- C. Planters or drills shall be equipped to plant directly through untilled residue or in a tilled seedbed prepared in a narrow strip.
- D. If row cultivation becomes necessary, it shall be limited to undercutting operations which minimize burial of surface residue.

- E. If injecting or incorporating fertilizer is necessary, it shall be applied to minimize the burial of surface residue.
- F. The amount and vertical orientation (for wind erosion) of residue needed to reduce erosion within the soil loss tolerance (T), or any other planned soil loss objective, such as crop tolerance, shall be done in accordance with the Field Office Technical Guide, Section I, Erosion Protection. Calculations shall account for the effects of other practices in the conservation management system.
- G. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount determined in IV. F.
- H. Estimating percent flat residue cover shall be done using the line-transect method according to UWEX Publication A3533. Estimating percent vertical residue shall be in accordance with other acceptable procedures.
- I. Percent residue shall be measured as soon as possible after planting.

V. Considerations

- A. Consider practicing no till or strip till continuously throughout the crop sequence, or managing as part of a system such as mulch till.
- B. Consider the selection of high residue producing crops and crop varieties in the rotation, cover crops, adjustments of plant populations and row spacing to enhance production of adequate amounts of crop residue.
- C. Consider maintaining a continuous no till system to maximize the improvement of soil tilth. Also, when no till is practiced, continuously soil reconsolidation will provide additional resistance to inter-rill and rill erosion.

- D. Consider the use of no till or strip till for the economic benefits, and to reduce the labor and time requirements of full width tillage.
- E. Consider testing soil pH and available phosphorous and potassium for crops expected to be grown in rotation before starting a no till system. See UWEX A2809 for optimum recommendations.
- F. Consider that a nutrient management plan with heavy manure application rates or incorporation may not be compatible with a no till system.
- G. Consider using crop varieties with increased seeding vigor and tolerance to cool soil conditions.
- H. Consider planting across the slope or perpendicular to prevailing winds.
- I. To enhance the value of residues for wildlife, consider maintaining a minimum of 50% residue cover evenly distributed on the soil surface throughout the year and leaving rows of unharvested crop standing at intervals across the field.

Moldenhauer, W.C. and Mielke, L.N., Crop Residue Management to Reduce Erosion and Improve Soil Quality, North Central, Conservation Report Number 42, (United States Department of Agriculture, Agriculture Research Service, November 1995).

USDA, Natural Resources Conservation Service, Estimates of Residue Cover Remaining after Single Operation of Selected Machines, Technical Note - Agronomy - WI-4, (USDA NRCS, December 22, 1993).

Wolkowski, R. P., 1997. Row fertilizer for in-row tillage systems. Proceedings of the Wisconsin Fertilizer, Aglime, and Pest Management Conference. 36:239 - 248. University of Wisconsin - Madison.

Wollenhaupt, N.C. and J. Pingry. Estimating Residue Using the Line Transect Method. University of Wisconsin - Extension, Bulletin A3533.

VII. Plans and Specifications

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Consideration, and Operation and Maintenance sections described in this standard. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

VIII. Operation and Maintenance

No operation and maintenance requirements have been identified for this practice.

IX. References

Kelling, K.A., L.G. Bundy, S.M. Combs, and J.B. Peters, 1997. Soil Test Recommendations for field, vegetable, and fruit crops. University of Wisconsin - Extension, Bulletin A2809.