

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

RESIDUE MANAGEMENT, SEASONAL

(Ac.)

CODE 344

DEFINITION

Managing the amount, orientation, and distribution of crop and other plant residues on the soil surface during a specified period of the year, while planting annual crops on a clean-tilled seedbed, or when growing biennial or perennial seed crops.

PURPOSES

- Reduce sheet and rill erosion.
- Reduce wind erosion
- Reduce off-site transport of sediment, nutrients or pesticides.
- Manage snow to 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.

Seasonal residue management includes managing and maintaining adequate crop residues on the soil surface during critical times of the year. It also includes the management of residues from biennial or perennial seed crops from the time of seed harvest until regrowth begins the next season.

CRITERIA

General Criteria Applicable to All Purposes

Where combines or similar machines are used for harvesting, they shall be equipped with spreaders capable of uniformly distributing residue over the entire field.

Residue shall not be burned.

The number, sequence, and timing of tillage and planting operations, and the selection of ground-engaging components, shall be managed to achieve the planned amount, distribution, and orientation of residue after planting or at other essential time periods. Acceptable alternative tillage sequences shall be evaluated using the current approved erosion prediction technology.

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.

Partial removal of residue by means such as baling, grazing, or other harvest methods shall be limited to retain the amount needed to meet the erosion reduction objective. The remaining residue shall be maintained on the surface through periods when erosion has the potential to occur, or until planting, whichever occurs first. Erosion prediction estimates shall account for the effects of other practices in the conservation management system.

Any tillage that occurs during the management period shall be limited to methods which leave residue on the surface and maintain the planned cover conditions needed to achieve soil loss objectives.

Additional Criteria to Reduce Wind Erosion

The amount and orientation of standing and surface residue, row direction and ridge height

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resource Conservation Service.

Residue Management, Seasonal (344)-2

needed at specific times of the year, and the amount of surface soil disturbance allowed to reduce erosion to the planned soil loss objective shall be determined using the current approved wind erosion prediction technology.

Partial removal of residue by means such as baling, grazing, or other harvest methods shall be limited to retain the amount needed to meet the erosion reduction objective. The remaining residue shall be maintained on the surface through periods when erosion has the potential to occur, or until planting, whichever occurs first. Wind erosion calculations shall account for the effects of other practices such as stripcropping, cross wind trap strips, or field windbreaks utilized in the conservation management system.

Any tillage that occurs during the management period shall be limited to methods which leave residue on the surface and maintain the planned cover conditions needed to achieve soil loss objectives.

Additional Criteria to Reduce Off-site Transport of Sediment, Nutrients or Pesticides.

The amount and orientation of residue required to reduce off-site movement of agricultural chemicals during the specified period shall be determined using the appropriate assessment tool(s) [Windows Pesticide Screening Tool (WIN-PST), Phosphorus Index (PI), Leaching Index (LI), erosion prediction technologies, or other recognized tools] for the site conditions.

Additional Criteria to Manage Snow to Increase Plant-Available Moisture

Crop stubble height during the time significant snowfall is expected to occur shall be:

- at least 10 inches for crops with a row spacing of less than 15 inches;
- at least 15 inches for crops with a row spacing of 15 inches or greater.

These heights shall be present over the entire field and at least 50% of the crop stubble shall be left standing after harvest.

Any tillage that occurs during this period shall be limited to undercutting tools such as blades,

sweeps or similar implements that minimize residue flattening or burial.

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.

To meet the quality criteria requirements for wildlife habitat (food, water, cover, etc.) in Section III of the FOTG, the planned system must provide a total rating of 0.5 or higher for the conservation treatment unit. Rating shall be recorded using Cropland Habitat Evaluation Worksheet (NE-CPA-32).

Residue and tillage management is directly related to the Disturbance factor and may be influenced by the Crop Rotation factor. The planned system may also need to address Field Size; Field Borders; Buffers; Odd Areas; and Interspersion of Habitats in order to meet quality criteria requirements for wildlife.

CONSIDERATIONS

General - Removal of crop residue 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.

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, by the use of cover crops, and by 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.

When planting in a low residue seedbed, completing tillage and planting in a single operation, or by performing primary tillage no more than three days before planting can minimize exposure to erosion; and in limited moisture areas, can conserve moisture for germination.

Increasing Plant-available Moisture – The effectiveness of stubble to trap snow increases with stubble height. Increasing the stubble height beyond the minimum required will increase the amount of snow trapped.

Variable height stubble patterns may be created to further increase snow trapping and storage.

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

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 and Considerations described in this standard.

Specifications including crop rotation, tillage and planting system type, fertilizer placement and method of application, crop residue cover, timeframe and other appropriate management requirements shall be recorded using Nebraska Conservation Planning Sheets, approved specification sheets, job sheets, narrative

statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Critical eroding areas (concentrated flow areas, or overland flow areas with inadequate cover) need to be stabilized with a cover crop, mulch, run-off control structure or other acceptable method as identified in the conservation plan. Critical area treatment needs to be applied immediately following harvest (or immediately following seedbed preparation on newly sodbusted ground).

REFERENCES

Bolton, Ryan. 2003. Impact of the surface residue layer on decomposition, soil water properties and nitrogen dynamics. M.S. thesis. Univ. of Saskatchewan, Saskatoon, Saskatchewan, CA.

Foster, G.R. Revised Universal Soil Loss Equation, Version 2 (RUSLE2) Science Documentation (In Draft). USDA-ARS, Washington, DC. 2005.

Renard, K.G., G.R. Foster, G.A. Weesies, D.K. McCool and D.C. Yoder, coordinators. 1997. Predicting soil erosion by water: A guide to conservation planning with the Revised Universal Soil Loss Equation (RUSLE). U.S. Department of Agriculture, Agriculture Handbook No. 703.

Shaffer, M.J., and W.E. Larson (ed.). 1987. Tillage and surface-residue sensitive potential evaporation submodel. In NTRM, a soil-crop simulation model for nitrogen, tillage and crop residue management. USDA Conserv. Res. Rep. 34-1. USDA-ARS.

Skidmore, E.L. and N.P. Woodruff. 1968. Wind erosion forces in the United States and their use in predicting soil loss. U.S. Department of Agriculture. Agriculture Handbook No. 346.

U.S.D.A. Natural Resources Conservation Service. 2002. National Agronomy Manual. 190-V. 3rd ed.