

NATURAL RESOURCES CONSERVATION SERVICE  
MONTANA CONSERVATION PRACTICE STANDARD

## RESIDUE MANAGEMENT, SEASONAL (ACRE)

### 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 soil erosion from wind.
- 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 grown.

Seasonal residue management includes managing residues of annual crops from harvest until the residue is:

- Buried by tillage for seedbed preparation
- Removed by grazing, or
- Mechanically removed

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

Residue shall be uniformly distributed over the entire field.

Combines or similar harvesting machines shall be equipped with spreaders capable of redistributing residues over at least 80 percent of the working width of the header.

**If harvesting equipment is not equipped to properly distribute residue, alternate equipment or methods may be used to distribute residue evenly over at least 80 percent of the surface area.**

Residues shall not be burned unless burning is an accepted practice in an integrated pest management (IPM) program developed and recommended by **Montana State University** or other industry accepted standard.

##### Additional Criteria to Reduce Sheet and Rill Erosion and Erosion from Wind.

The amount and orientation of residue needed to reduce erosion within the soil loss tolerance (T) or any other planned soil loss objective shall be determined using current approved erosion prediction technology (**RUSLE2 and WEQ**).

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.

NRCS, MT  
September 2004

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

**Note:** This type of font (**AaBbCcDdEe 123...**) indicates NRCS National Standards.  
This type of font (**AaBbCcDdEe 123...**) indicates Montana Supplement.

Residue reduction from grazing cropland aftermath should be based on a planned grazing system that specifies the number and kind of livestock and length of time livestock will remain in a particular field or planning unit. The amount of removal by grazing will be based on one AUM = 750 pounds of residue.

Any tillage that occurs during the management period shall be limited to methods that maintain the planned cover conditions.

**When crops are grown that result in low amounts of residue due to climatic conditions such as drought, flooding, or wildfire, supplemental conservation measures such as applications of residue, manure, establishment of a cover crop, surface roughening, etc., are required to the extent that planned soil loss objectives are met.**

Any tillage that occurs during the management period shall be limited to methods that leave residue on the surface and maintain the planned cover conditions.

#### **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 Windows Pesticide Screening Tool (WIN-PST), Phosphorus Index (PI), Leaching Index (LI), or erosion prediction technologies, for the site conditions.

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

Harvesting equipment shall be adjusted to leave standing stubble at least 6 inches tall. Stubble shall be maintained in a standing orientation over winter to trap and retain snow. **For best results, stubble should be "scalped" (where the height of standing stubble is a different height with each pass).**

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.

**Loose residue may be removed provided that the remaining residue is left standing.**

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

The amount of residue, height of the stubble, and length of the management period necessary for meeting habitat requirements for the target species or wildlife population shall be determined using an approved habitat evaluation procedure **wildlife management plan.**

Tillage operations shall be delayed until the end of the management period to maintain the food and cover value of the residue.

#### **CONSIDERATIONS**

Removal of plant residue by baling or grazing may have a negative impact on resources. These activities should not be performed without full evaluation of impacts on other 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.

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.

**Crop residues are buried at a greater percentage with tillage speeds faster than 5 miles per hour.**

Leaving standing stubble taller than the six inch minimum will increase the amount of snow trapped.

Leaving one or two rows of unharvested crop standing at intervals across the field can enhance the value of residue for wildlife habitat. Unharvested crop rows have the greatest value when they are adjacent to other cover types, such as grassy or brushy areas or woodland.

**Eighty-85% of crop residues will remain on the soil surface after winter decomposition.**

**Additionally, 80-85% of crop residues will remain after a summer fallow period due to decomposition.**

**Repeated burning of crop residues is not recommended. Repeated burning reduces soil fertility, water intake rates, soil organic matter, and increases the potential for erosion.**

**USDA, Natural Resources Conservation Service, Field Office Technical Guide, Section IV, Upland Wildlife Habitat Management (645), December 1984.**

## **PLANS AND SPECIFICATIONS**

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

Specifications shall be recorded using approved job sheets, narrative statements in the conservation plan, or other acceptable methods.

**USDA, Natural Resources Conservation Service, National Agronomy Manual, Third Ed., Part 503 – Crop Production, June 2000.**

**Burning: Effects on Soil Quality. R. Fasching. USDA NRCS State Agronomist. November 1999.**

**A seasonal residue management establishment plan shall include the following information:**

- 1. Locations map - field numbers and a map or sketch of the area to be established.**
- 2. Measured acres.**
- 3. Date implementation is scheduled and applied.**
- 4. Before and after soil loss prediction documentation.**
- 5. Critical time period(s) to maintain residue.**
- 6. Amount (percent) of soil surface cover required to meet planned objectives.**
- 7. The Residue Management, Seasonal specifications sheet.**

## **OPERATION AND MAINTENANCE**

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

## **REFERENCES**

**Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE), USDA ARS Ag. Handbook No. 703. January 1997.**