United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E484A

Mulching to improve soil health

Conservation Practice 484: Mulching

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Implement a crop rotation which utilizes mulch and addresses all four principle components of soil health – increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical, and biological disturbance. Plant-based mulching materials will be applied at least once during the rotation. The rotation will include at least four different crops and/or cover crops grown in a sequence that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Criteria

- Use plant-based mulching materials of suitable quantity and quality to add organic matter, provide food and shelter for soil biota, and protect the soil surface from raindrop impact and crusting while allowing for adequate soil aeration.
- Apply plant-based mulching materials with a carbon to nitrogen ratio (C:N) less than 30 to 1 to reduce soil nitrogen immobilization by soil biota (typical ratio examples – hairy vetch cover crop 11:1, fresh grass clippings 17:1, mature alfalfa hay 25:1, corn stalks 60:1, wheat straw 80:1, and pine needles 80-110:1).
- Do not apply mulch with C:N less than 20:1 to an area of designed flow in watercourses.

CONSERVATION STEWARDSHIP PROGRAM

- The crop rotation includes at least four crops and/or cover crops grown in a sequence.
- An evaluation of the system using the current approved SCI procedure results in zero or higher.
- Use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.
- Select crops to be mulched, mulching materials, and rates of application that do not contribute to pest problems.
- For all organic or transitioning-to-organic operations, follow all National Organic Program (NOP) rules.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop. The crop rotation must include at least four crops and/or cover crops grown in a sequence.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ Prior to implementation, provide NRCS with the planned mulching information. Select crops to be mulched, mulching materials, and rates of application that do not contribute to pest problems.

Field	Crop	Mulching Material	Planned Rate of application (pounds/acre)	Planned Application Date

☐ During implementation, notify NRCS of any planned changes in the cropping system, crop management, or mulching to verify the planned system meets the enhancement criteria.

☐ During implementation, use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.

CONSERVATION STEWARDSHIP PROGRAM

☐ After implementation, provide NRCS with the applied mulching information.

Field	Crop	Mulching Material	Actual Rate of application (pounds/acre)	Actual Application Date

☐ If changes were made to crop rotation or tillage operation(s) after implementation, complete the tables above to document the changes.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

☐ Prior to implementation, verify that the crop rotation includes at least four crops and/or cover crops grown in a sequence.

☐ Prior to implementation, use information provided from the participant to calculate the Management SCI value using current NRCS wind and water erosion prediction technologies. **Management SCI Value = _____**

☐ During implementation, evaluate any planned changes in the cropping system, crop management, or mulching to verify the planned system meets the enhancement criteria.

☐ If changes were made from the planned system after implementation, use information provided from the participant to calculate Management SCI value to document that the applied system met the enhancement criteria. **Management SCI Value = _____**

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

South Dakota (SD) Supplement to Conservation Enhancement Activity

CONSERVATION STEWARDSHIP PROGRAM

E484A

Additional Criteria for SD:
In addition to the criteria specified in the national job sheet E484A, the following additional criteria apply in SD:

- Utilize Table 1 for the carbon to nitrogen ratios in cropping systems to select mulch materials.

Table 1. Carbon to nitrogen ratios of crop residues and other organic materials

Material	C:N Ratio
rye straw	82:1
wheat straw	80:1
oat straw	70:1
corn stover	57:1
rye cover crop (anthesis)	37:1
pea straw	29:1
rye cover crop (vegetative)	26:1
mature alfalfa hay	25:1
Ideal Microbial Diet	**24:1**
rotted barnyard manure	20:1
legume hay	17:1
beef manure	17:1
young alfalfa hay	13:1
hairy vetch cover crop	11:1
soil microbes (average)	8:1

- Source: Carbon to Nitrogen Ratios in Cropping Systems located under "Dig Deeper, Learn More" on the NRCS Soil Health Literature page https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/health/mgnt/?cid=STELPRDB1257753