

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**COVER CROP**

(Ac.)

CODE 340

**DEFINITION**

Crops including grasses, legumes, and forbs for seasonal cover and other conservation purposes.

**PURPOSE**

- Reduce erosion from wind and water.
- Increase soil organic matter content.
- Capture and recycle or redistribute nutrients in the soil profile.
- Promote biological nitrogen fixation and reduce energy use.
- Increase biodiversity.
- Suppress weeds.
- Manage soil moisture.
- Minimize and reduce soil compaction.

**CONDITIONS WHERE PRACTICE APPLIES**

All lands requiring vegetative cover for natural resource protection and or improvement.

**CRITERIA**

**General Criteria Applicable to All Purposes**

Cover crop plant materials, seedbed preparation, seeding rates, seeding dates, seeding depths, fertility requirements, and planting methods shall be consistent with approved local vegetation establishment criteria and local site conditions.

Cover crop plant materials, establishment timing and termination timing shall be compatible with other components of the

planned crop rotation and management system.

Herbicides used to manage cover crops shall be compatible with establishment and growth of the following planned crops in rotation.

The selected cover crop plant materials shall not include plant species listed in South Dakota as noxious or invasive weeds.

Cover crop residues shall not be burned.

**Additional Criteria to Reduce Erosion from Wind and Water**

Cover crop establishment, in conjunction with other conservation practices, shall be planned to adequately protect the soil during planned critical soil erosion period(s)

Cover crop plant materials shall have physical plant characteristics and growth habits to reduce soil erosion to the planned soil loss objective.

The amount and timing of cover crop residues and/or canopy cover that is necessary to meet the planned soil loss objective shall be determined using current NRCS approved soil erosion prediction technology.

**Additional Criteria to Increase Soil Organic Matter Content**

Cover Crop plant materials shall be selected and managed to provide the amounts of above ground and root biomass to maintain a positive trend in the soil organic matter sub-factor using the NRCS Soil Conditioning Index (SCI) procedure.

Cover crops shall be planted and established as early as possible and terminated as late as possible to maximize biomass production considering crop insurance criteria, the time

needed to prepare the field for planting the next crop, and soil moisture depletion.

#### **Additional Criteria to Capture and Recycle Excess Nutrients in the Soil Profile**

Cover crops shall be established and actively growing prior to expected period(s) of increased nutrient leaching potential.

Cover crop plant materials shall be selected based on their ability to take up and utilize large amounts of residual nutrients from the soil profile.

A nutrient budget, as defined in Conservation Practice Standard (CPS) Nutrient Management (590) shall be prepared for each cover crop interval in the rotation to manage residual nutrients in the soil profile, nutrient sources and amounts supplied to the cover crop and the planned nutrient uptake amounts by the cover crop.

Terminate the cover crop as late as feasible to maximize plant biomass production and nutrient uptake, considering crop insurance criteria, the time needed to prepare the field for planting the next crop, and soil moisture depletion.

#### **Additional Criteria to Promote Biological Nitrogen Fixation and Reduce Energy Use**

Cover crop plant materials shall be legumes or legume grass mixtures.

Cover crop legume seed shall be supplied with appropriate Rhizobium inoculant currently in the soil or placed with the seed at time of planting to insure proper root nodule formation and function.

Nitrogen source material application rates shall be adjusted to account for available Nitrogen supplied by the growing legumes and the residual Nitrogen credit for the following crop in rotation.

Established cover crop stand densities shall consist of no less than 50 percent legume species

#### **Additional Criteria to Increase Biodiversity**

Select cover crop plant materials to achieve one or more of the following:

- different maturity dates;
- attract beneficial insects;
- attract pollinator species;
- increase the soil biological diversity;
- serve as an insect trap crop;
- provide food and cover for wildlife.

#### **Additional Criteria for Weed Suppression**

Cover crop plant materials shall be selected based on their chemical or physical characteristics to compete with and/or suppress weed populations.

Seeding rate, method and timing shall be adjusted as needed to encourage dense stands and rapid canopy development to suppress weed growth and reduce the reliance on chemical suppression techniques.

Noxious or invasive weed populations shall be managed before and during the cover crop-crop interval.

Cover crop residues shall be left on the soil surface as a non-chemical suppression technique to management weed populations.

For long-term weed suppression, reseeding annuals and/or biennial species can be used prior to the following crop in rotation.

#### **Additional Criteria for Soil Moisture Management**

Termination of the cover crop shall be timed sufficiently early to conserve soil moisture for the following crop's germination and growth needs.

Cover crop residues shall be left on the soil surface when soil moisture conservation for the following crop is an objective.

In areas of potential excess soil moisture, delay termination as long as possible to allow the cover crop to grow and maximize the amount of soil moisture removed.

Consider crop insurance criteria and the time needed to prepare the field for planting the following crop.

### **Additional Criteria to Minimize and Reduce Soil Compaction**

Cover crop plant materials shall be selected and managed to produce deep root growth and large amounts of surface and/or root biomass to improve soil organic matter, soil structure and water infiltration for improved crop root growth in the soil profile.

### **CONSIDERATIONS**

Plant cover crops in a timely matter to establish a good stand.

When applicable, ensure cover crops are managed and are compatible with the client's crop insurance criteria.

Maintain an actively growing cover crop as late as feasible to maximize plant growth, allowing time to prepare the field for the next crop and moisture depletion.

When used to redistribute nutrients from deeper in the profile up to the surface layer, consider killing of the cover crop in relation to the planting date of the following crop.

If the objective is to best synchronize the use of cover crop as a green manure to cycle nutrients, factors such as the carbon/nitrogen ratios may be considered to terminate cover crop early and have a faster mineralization of nutrients to match release of nutrients with nutrient uptake of the following crop in rotation.

The right time to terminate a cover crop will depend on the specific rotation, weather, and grower objectives.

Use deep-rooted species to maximize nutrient recovery.

Use grasses to utilize more soil nitrogen, and legumes to utilize both nitrogen and phosphorus.

Avoid cover crop species that harbor or carryover potentially damaging diseases or insects.

For most CPS Cover Crop (340) purposes, for which cover crops are established, the desirable combined canopy and surface cover is 90 percent or greater and the above ground (dry weight) biomass production is at least 4,000 pounds/acre.

Cover crops may be used to improve site conditions for establishment of perennial crops species during the crop rotation.

Use plant species that enhance bio-fuels opportunities.

Use plant species that enhance forage opportunities for pollinators by using diverse legumes and other forbs.

Use a diverse cover crop mixture of two or more species to address multiple purposes.

### **PLANS AND SPECIFICATIONS**

Plans and specifications will be prepared for the practice site. Plans for the establishment of cover crops shall include:

Plans and specifications shall be prepared for each conservation management unit (CMU).

Specifications for the establishment and management of cover crops shall include:

- CMU/Field identification and treatment acres;
- Plant materials to be established and managed as cover crops;
- Seeding and establishment methods, dates and rates;
- The Field operation "management record" from RUSLE2 or WEPS for the Crop Rotation that includes Cover Crops;
- Planned rates, methods and timing of nutrient and pesticide applications;
- Planned dates and method for terminating the cover crop;
- Other information pertinent to establishing and managing the cover crop.

Plan specifications shall be recorded using approved conservation practice specification sheets and additional Documentation Requirements for this conservation practice (SD-DR-340).

### **OPERATION AND MAINTENANCE**

Manage growth of the cover crop to reduce competition from volunteer plants and shading.

Manage weeds in cover crops by mowing or other suppression pest management techniques.

Manage soil moisture depletion by selecting water efficient plant materials and terminating the cover crop before excessive evapotranspiration occurs.

Evaluate the cover crop management as part of the crop rotation to determine if the conservation practice purposes and client objectives are met.

When the cover crop system is not meeting the planned purpose(s) or client objectives, adjust the cover crop timing, plant material mix and management techniques as needed and document with an updated CPS Cover Crop (340) Job Sheet.

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