

**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**

Plant species, seedbed preparation, seeding rates, seeding dates, seeding depths, fertility requirements, and planting methods will be consistent with approved local criteria and site conditions. Refer to [Appendix 1](#) for adapted species, seeding rates, dates and depths. Refer to Table 1, Cover Crop – Common Species and Properties, when selecting commonly used cover crop species in Texas to best address the applicable purpose(s) for soil health. Table 1 is not an all inclusive list, consult with your NRCS Agronomist for cover crop species suitability.

The application of a dead litter cover, where needed, will follow the guidance in [Appendix 2](#).

The species selected will be compatible with other components of the cropping system.

Ensure herbicides used with cover crops are compatible with the following crop.

Ensure that plants are not listed as noxious weeds or invasive species for a particular state.

Cover crop residue will not be burned.

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

Time cover crop establishment in conjunction with other practices, so that the soil will be adequately protected during the critical erosion period(s).

Plants selected for cover crops will have the physical characteristics necessary to provide adequate protection.

Determine the amount of surface and/or canopy cover needed from the cover crop using current erosion prediction technology.

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

Cover crop species will be selected on the basis of producing high volumes of organic material and or root mass to maintain or improve soil organic matter.

The NRCS Soil Conditioning Index (SCI) procedure will be used to determine the amount of biomass required to have a positive trend in the soil organic matter subfactor.

The cover crop shall be planted as early as possible and be terminated as late as feasible to maximize plant 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 will be established and actively growing before the expected period(s) of nutrient leaching.

Select cover crop species for their rooting depth and ability to take up large amounts of nutrients from the soil profile.

Termination of the cover crop will depend on the specific rotation, weather and objectives. When used to redistribute nutrients from deeper in the soil profile up to the surface layer, the cover crop will be killed 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 kill early and have a faster mineralization of nutrients to match release of nutrient with uptake by following cash crop. A late kill may be used if the objectives are to use as a biocontrol and maximize the addition of organic matter. The right timing for killing the cover crop will depend on the specific rotation, weather and objectives.

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

Use legumes or legume-grass mixtures to establish cover crops.

Legume seed will be inoculated at the time of planting with the appropriate strain of Rhizobium bacteria, unless it is already present in the soil.

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

Select cover crop species that have different maturity dates, attract beneficial insects, attract pollinators, increase soil biological diversity, serve as a trap crop for damaging insects, and/or provide food and cover for wildlife habitat management.

Add cover crop types that diversify the crop rotation. (cool-season grass, cool season broadleaf, warm-season grass, warm season broadleaf.)

#### **Additional Criteria for Pest Suppression**

Species for the cover crop will be selected for their chemical or physical characteristics to compete with weeds, suppress disease or insects.

Higher seeding rates to provide additional cover will help control weeds to eliminate or reduce herbicide use.

Cover crops residues will be left on the soil surface to maximize allelopathic (chemical) and mulching (physical) effects.

A late kill may be used if the objectives are to use as a biocontrol.

For long-term weed suppression, reseeding annuals and/or biennial species can be used.

**Additional Criteria to Provide Supplemental Forage**

Species selected will have desired forage traits, be palatable to livestock, and not interfere with the production of subsequent crops.

Forage provided by the cover crop may be hayed or grazed as long as sufficient biomass is left for resource protection.

**Additional Criteria for Soil Moisture Management**

When soil moisture deficit is a concern, terminate growth of the cover crop sufficiently early to conserve soil moisture for the subsequent crop. Cover crops established for moisture conservation shall be left on the soil surface.

In areas of excess soil moisture, allow the cover crop to grow as long as possible to maximize soil moisture removal.

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

Select and manage cover crop species that will produce deep roots and large amounts of surface or root biomass to increase soil organic matter, improve soil structure, and increase water infiltration.

**CONSIDERATIONS**

Plant cover crops in a timely manner 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 and planned benefits, allowing adequate time to prepare the field for the next crop.

The right moment to kill the cover crop will depend on the specific rotation, weather, and grower objectives.

Use deep rooted species to maximize nutrient recovery.

If the objective is to best synchronize the use of cover crop as a green manure to cycle nutrients, consider the carbon to nitrogen (C:N) ratio of a cover crop to predict when the N will become available as the cover crop decomposes.

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 purposes for which cover crops are established, the combined canopy and surface cover is at nearly 90 percent or greater, and the above ground (dry weight) biomass production is sufficient to meet desired objective.

Cover crops may be used to improve site conditions for establishment of perennial species.

Use plant species that enhance bio-fuels opportunities.

Use plant species that enhance forage or grazing opportunities that may be used by pollinators and attract beneficial insects.

Use diverse mixtures 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:

- Field number and acres

- Species or species of plants to be established.
- Seeding rates.
- Recommended seeding dates.
- Seeding method and establishment procedures.
- Planned rates and timing of nutrient application, if needed.
- Planned dates and method to terminate the cover crop.
- Other information pertinent to establishing and managing the cover crop.

Plans and specifications for the establishment and management of cover crops may be recorded in narrative form, on job sheets, or on other forms.

### **OPERATION AND MAINTENANCE**

Control growth of the cover crop to reduce undesired seed production or competition with subsequent crops from volunteer plants and shading.

Control weeds in cover crops by mowing or by using other pest management techniques.

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

Evaluate the cover crop to determine if the cover crop is meeting the planned purpose(s). If the cover crop is not meeting the purpose(s) adjust the management, change the species of cover crop, or choose a different technology.

### **REFERENCES**

- A. Clark (ed.). 2007. Managing cover crops profitably. 3<sup>rd</sup> ed. Sustainable Agriculture Network Handbook Series; bk 9.
- Hargrove, W.L., ed. Cover crops for clean water. SWCS, 1991.
- Magdoff, F. and H. van Es. Cover Crops. 2000. p. 87-96 *In* Building soils for better crops. 2nd ed. Sustainable Agriculture Network Handbook Series; bk 4. National Agriculture Library. Beltsville, MD.
- Reeves, D.W. 1994. Cover crops and erosion. p. 125-172 *In* J.L. Hatfield and B.A. Stewart (eds.) Crops Residue Management. CRC Press, Boca Raton, FL.

# APPROVAL AND CERTIFICATION

## COVER CROP

(Ac.)

CODE 340

### PRACTICE SPECIFICATIONS APPROVED:

<u>/s/ William H. Durham</u>	<u>1/04/2012</u>
State Agronomist	Date

<u>/s/ Susan C. Baggett</u>	<u>1/04/2012</u>
State Resource Conservationist	Date

### CERTIFICATION:

Reviewed and determined adequate without need of revision.

<u>Zone Agronomist</u>	<u>Date</u>
<u>Zone Agronomist</u>	<u>Date</u>