

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**COVER CROP  
(Ac.)**

**CODE 340**



**DEFINITION**

Grasses, legumes, and forbs planted for seasonal vegetative cover.

**PURPOSE**

This practice is applied to support one or more of the following purposes:

- Reduce erosion from wind and water.
- Maintain or increase soil health and organic matter content.
- Reduce water quality degradation by utilizing excessive soil nutrients.
- Suppress excessive weed pressures and break pest cycles.
- Improve soil moisture use efficiency.
- Minimize soil compaction.

**CONDITIONS WHERE PRACTICE APPLIES**

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

**CRITERIA**

**General Criteria Applicable to All Purposes**

Follow all federal, state, and local laws, rules, and regulations.

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#) or visit the [Field Office Technical Guide](#).

Plant species, seedbed preparation, seeding rates, seeding dates, seeding depths, fertility requirements, and planting methods will be consistent with applicable local criteria and soil/site conditions. See recommendations in the Florida Conservation Practice Standard [Cover Crop, Code 340, Guidance](#).

Do not plant any species found on the Florida Department of Agriculture and Consumer Services or Florida Department of Environmental Protection noxious or prohibited weeds lists (<http://www.freshfromflorida.com/Divisions-Offices/Plant-Industry/Business-Services/Plant-Pest-Permits/Noxious-Weed-Permit>). Additionally, do not plant any species listed as a Category 1 invasive plant species as defined by the Florida Exotic Pest Plant Council ([FLEPPC - Florida Exotic Pest Plant Council](#)).

Select species that are compatible with other components of the cropping system. Ensure herbicides used with crops are compatible with cover crop selections and purpose(s). Apply herbicides and pesticides according to Florida NRCS Conservation Practice Standard [Integrated Pest Management, Code 595](#).

Cover crops may be established between successive production crops, or companion-planted or relay-planted into production crops. Select species and planting dates that will not compete with the production crop yield or harvest.

Do not burn cover crop residue.

Determine the method and timing of termination to meet the grower's objective and the current NRCS [Cover Crop Termination Guidelines](#).

When a cover crop will be grazed or hayed, ensure that crop selection(s) comply with pesticide label rotational crop restrictions and that the planned management will not compromise the selected conservation purpose(s).

Do not harvest cover crops for seed.

If the specific rhizobium bacteria for the selected legume are not present in the soil, treat the seed with the appropriate inoculum at the time of planting.

Impact to cultural resources, wetland, and Federal and State protected species needs to be determined prior to implementation of this practice. Any impacts need to be avoided or minimized to the extent practical during planning, design and implementation of this conservation practice in accordance with established National and Florida NRCS Policy, [General Manual](#) Title 420-Part 401, Title 450-Part 401, and Title 190-Parts 410.22 and 410.26; National Planning and Procedures Handbook FL Supplement to Parts 600.1 and 600.6; [National Cultural Resources Procedures Handbook](#); and the [National Environmental Compliance Handbook](#).

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

Time the cover crop establishment in conjunction with other practices to adequately protect the soil during the critical erosion period(s).

Select cover crops that will have the physical characteristics necessary to provide adequate erosion protection.

Use the current erosion prediction technology to determine the amount of surface and/or canopy cover needed from the cover crop to achieve the erosion objective.

**Additional Criteria to Maintain or Increase Soil Health and Organic Matter Content**

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

The planned crop rotation including the cover crop and associated management activities will score a Soil Conditioning Index (SCI) value > 0, as determined using the current approved NRCS SCI procedure, with appropriate adjustments for additions to and or subtractions from plant biomass.

Plant the cover crop shall as early as possible and terminate it as late as practical for the producer's cropping system 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 Reduce Water Quality Degradation by Utilizing Excessive Soil Nutrients**

Establish cover crops as soon as practical prior to or after harvest of the production crop. (i.e., before or after harvest)

Select cover crop species for their ability to effectively utilize nutrients.

Terminate the cover crop as late as practical to maximize plant biomass production and nutrient uptake. Practical considerations for termination date may include crop insurance criteria, the amount of time needed to prepare the field for planting the next crop, weather conditions, and cover crop effects on soil moisture and nutrient availability to the following crop.

If the cover crop will be harvested for feed (hay/balage/etc.), choose species that are suitable for the planned livestock, and capable of removing the excess nutrients present.

**Additional Criteria to Suppress Excessive Weed Pressures and Break Pest Cycles**

Select cover crop species for their life cycles, growth habits, and other biological, chemical and or physical characteristics to provide one or more of the following:

- Suppress or compete with weeds.
- Break pest life cycles or suppress plant pests or pathogens.
- Provide food or habitat for natural enemies of pests.
- Release compounds such as glucosinolates that suppress soil borne pathogens or pests.
- Do not harbor pests or diseases of subsequent crops in the rotation.

**Additional Criteria to Improve Soil Moisture Use Efficiency**

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

**Additional Criteria to Minimize Soil Compaction**

Select cover crop species that have the ability to root deeply and the capacity to penetrate or prevent compacted layers.

**CONSIDERATIONS**

Plant cover crops in a timely matter and when there is adequate moisture 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 to optimize soil moisture.

Select cover crops that are compatible with the production system, well adapted to the region's climate and soils, and resistant to prevalent pests, weeds, and diseases. Avoid cover crop species that harbor or carry over potentially damaging diseases or insects. Allelopathic effects to the subsequent crop should be evaluated when selecting the appropriate cover crop.

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

When cover crops are used for grazing, select species that will have desired forage traits, be palatable to livestock, and not interfere with the production of the subsequent crop.

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

Cover crops may be selected to provide food or habitat for natural enemies of production crop pests.

Cover crop residues should be left on the soil surface to maximize allelopathic (chemical) and mulching (physical) effects. Cover crops may be selected that release biofumigation compounds that inhibit soil-borne plant pests and pathogens.

Seed a higher density cover crop stand to promote rapid canopy closure and greater weed suppression. Increased seeding rates (1.5 to 2 times normal) can improve weed-competitiveness. Species can be selected to serve as trap crops to divert pests from production crops.

Select a mixture of two or more cover crop species from different plant families to achieve one or more of the following: (1) species mix with different maturity dates, (2) attract beneficial insects, (3) attract pollinators, (4) increase soil biological diversity, (5) serve as a trap crop for insect pests, or (6) provide food and cover for wildlife habitat management.

Plant legumes or mixtures of legumes with grasses, crucifers, and/or other forbs to achieve biological nitrogen fixation. Select cover crop species or mixture, and timing and method of termination that will maximize efficiency of nitrogen utilization by the following crop, considering soil type and conditions, season and weather conditions, cropping system, C:N ratio of the cover crop at termination, and anticipated nitrogen needs of the subsequent crop. Use UF/IFAS recommended nitrogen credits from the legume and reduce nitrogen applications to the subsequent crop accordingly. Time the termination of cover crops to meet nutrient release goals. Legumes add the most plant-available N if terminated when about 30% of the crop is in bloom.

Termination at early vegetative stages may cause a more rapid release compared to termination at a more mature stage. Both residue decomposition rates and soil fertility can affect nutrient availability following termination of cover crops

#### **Additional Considerations to Reduce Erosion by Wind or Water**

To reduce erosion, best results are achieved when the combined canopy and surface residue cover attains 90 percent or greater during the period of potentially erosive wind or rainfall.

#### **Additional Considerations to Reduce Water Quality Degradation by Utilizing Excessive Soil Nutrients**

Use deep-rooted species to maximize nutrient recovery.

When appropriate for the crop production system, mowing certain grass cover crops (e.g., sorghum-sudangrass, pearl millet) prior to heading and allowing the cover crop to regrow can enhance rooting depth and density, thereby increasing their subsoiling and nutrient-recycling efficacy.

#### **Additional Considerations to Increase Soil Health and Organic Matter Content**

Increase the diversity of cover crops (e.g., mixtures of several plant species) to promote a wider diversity of soil organisms, and thereby promote increased soil organic matter. Plant legumes or mixtures of legumes with grasses, crucifers, and/or other forbs to provide nitrogen through biological nitrogen fixation. Legumes add the most plant-available N if terminated when about 30% of the crop is in bloom.

#### **PLANS AND SPECIFICATIONS**

Prepare plans and specifications for each field or treatment unit according to the planning criteria and operation and maintenance requirements of this standard. Specifications shall describe the requirements to apply the practice to achieve the intended purpose for the practice site. Plans for the establishment of cover crops shall, as a minimum, include the following specification components in an approved Cover Crop, 340, Implementation Requirements document:

- Field number and acres
- Species of plant(s) to be established.
- Seeding rates.
- Seeding dates.
- Establishment procedure.
- Rates, timing, and forms of nutrient application (if needed).
- Dates and method to terminate the cover crop.
- Other information pertinent to establishing and managing the cover crop e.g., if haying or grazing is planned specify the planned management for haying or grazing.

#### **OPERATION AND MAINTENTNCE**

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 Agric. Net. Hand. 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.