

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD  
CONNECTICUT**

**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 shall be consistent with Table 1 or as approved by the Connecticut State Resource Conservationist.

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

The species selected will be compatible with the nutrient management and pest management provisions of the overall conservation plan.

No Federally-listed noxious plants or species on the Connecticut list of invasive and potentially invasive plant shall be planted.

Cover crops will be terminated by harvest, frost, mowing, tillage, crimping, and/or herbicides in preparation for the following crop.

Herbicides used with cover crops will be compatible with the following crop.

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 ability to take up large amounts of nutrients from the rooting profile of the soil.

Terminate the cover crop as late as feasible to maximize plant biomass production. Consider 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**

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

The specific Rhizobium bacteria for the selected legume will either be present in the soil or the seed will be inoculated at the time of planting.

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

Select cover crop species to achieve one or more of the following: species mix with 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.

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

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

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 for Soil Moisture Management**

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 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 soil moisture through better infiltration.

### **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 kill early and have a faster mineralization of nutrients to match release of nutrient with uptake by following cash 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.

Use grasses to utilize more soil nitrogen, and legumes 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 at least 4,000 lbs/acre.

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 opportunities for pollinators by using diverse legumes and other forbs.

Use a diverse mixture of 2 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.
- Establishment procedure.
- Planned rates and timing of nutrient application.
- 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.

## **SEEDING METHODS**

When conditions warrant seedbed preparation, conduct minimum soil disturbance during and after seeding to reduce potential soil erosion yet ensure adequate contact for seed germination.

Direct seeding after crop harvest may be accomplished by use of no tillage drills.

Broadcasting during or after crop harvest may be done by use of hand operated cyclone seeder, aerial equipment, or tractor mounted seeder without seedbed preparation if adequate moisture is present.

When moisture is lacking, consider broadcasting seed during crop harvesting operations followed by light tillage to provide better soil-seed contact from equipment usage.

When applying seed aurally prior to crop harvest, increase rates per acre by 50% and seed within 30 days of harvest to prevent poor stand vigor and damage of the cover by harvesting equipment.

## **SOIL AMENDMENTS**

Incorporate manure prior to seeding, or apply after the crop is well established and at a rate light enough to prevent smothering

## **PLANT SELECTION**

Vegetation most commonly used for seasonal cover is included in Table 1. The crops will be seeded not later than the dates shown to provide adequate cover for the periods indicated.

## **MANAGEMENT**

Encourage conservation tillage techniques that leave a minimum of 30 percent cover of crop residue on the soil surface at the time of seeding the main crop. These techniques include use of no tillage or reduced tillage equipment and/or chemical vegetation control.

## **OPERATION AND MAINTENANCE**

For each field, record the species selected, seeding date(s), rate per acre, method of seeding, soil amendments (if any, including manure applications), date and method of termination, and dates and notes of any observations made of cover, residue, or failure areas.

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

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

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

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; Book 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.

| <b>TABLE 1</b><br><b>LATEST SEEDING DATES FOR ESTABLISHING ADEQUATE ANNUAL COVER ON</b><br><b>CROPLAND – CONNECTICUT</b> |   |                     |                |                |
|--|---|---------------------|----------------|----------------|
|  | SEEDING RATES                             | PERIOD PROTECTED    |                |                |
| SPECIES  | POUNDS / ACRE                             | WINTER              | SUMMER         | FALL           |
| <b>ANNUAL RYEGRASS</b><br>(Lolium multiflorum)   | <b>25 – 35</b>                            | <b>SEPTEMBER 15</b> | <b>MAY 1</b>   | <b>JULY 15</b> |
| <b>SMOOTH BROMEGRASS</b><br>(Brontus inermus)  | <b>10</b>                                 | <b>SEPTEMBER 1</b>  | <b>JULY 15</b> |                |
| <b>HAIRY VETCH</b><br>(Vicia villosa)  | <b>30</b>                                 | <b>SEPTEMBER 1</b>  |                |                |
| <b>WHEAT, WINTER</b><br>(Triticum vulgare)   | <b>120</b>                                | <b>OCTOBER 1</b>    |                |                |
| <b>OATS</b><br>(Avena sativa)  | <b>100</b>                                | <b>SEPTEMBER 10</b> | <b>MAY 1</b>   |                |
| <b>SUDANGRASS</b><br>(Sorghum vulgare var.<br>sudanense)   | <b>35</b>                                 |                     |                | <b>JUNE 15</b> |
| <b>BUCKWHEAT</b><br>(Fagopyrum sagittatum)   | <b>50 – 75</b>                            |                     |                | <b>JULY 15</b> |
| <b>GRAIN RYE</b><br>(Secale cereale)   | <b>CONNECTICUT</b><br><b>SEE TABLE 1A</b> |                     |                |                |

| <b>TABLE 1A</b>   |  |                         |         |                                     |
|---|--|-------------------------|---------|-------------------------------------|
| <b>LATEST SEEDING DATES FOR ESTABLISHING CEREAL RYE COVER - CONNECTICUT</b>   |  |                         |         |                                     |
|   |  | SEEDING RATES /<br>ACRE |         | <b>“GRAIN” RYE*</b>                 |
| LOCATION  |  | POUNDS                  | BUSHELs | SEEDING DATES                       |
| 1.  | <b>MLRA 144 UPLANDS ABOVE 1,000 FEET ELEVATION AND ANY DEPRESSIONAL F ROST POCKETS</b> | 112                     | 2       | <b>UP TO SEPTEMBER 15</b>           |
|   |  | 140                     | 2.5     | <b>SEPTEMBER 16 TO SEPTEMBER 25</b> |
| 2.  | <b>MLRA 144 BELOW 1000 FEET ELEVATION AND MORE THAN FIVE MILES INLAND</b>              | 112                     | 2       | <b>UP TO SEPTEMBER 15</b>           |
|   |  | 140                     | 2.5     | <b>SEPTEMBER 16 TO OCTOBER 1</b>    |
| 3.  | <b>MLRA 145 AND COASTAL AREAS IN MLRA 144 UP TO FIVE MILES INLAND</b>                  | 112                     | 2       | <b>UP TO SEPTEMBER 30</b>           |
|   |  | 140                     | 2.5     | <b>OCTOBER 1 TO OCTOBER 10</b>      |
| <p><b>* <u>IN CONNECTICUT</u> - USE SEED REFERRED TO IN TRADE AS “CLEAR-TAG” THAT MEETS THE REQUIREMENTS OF CONNECTICUT GENERAL STATUTES, CHAPTER 424, SECTION 22-55 THROUGH 22-59 AS AMENDED</b></p> |  |                         |         |                                     |