

**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.
- Increase biodiversity.
- Weed suppression.
- Provide supplemental forage.
- Soil moisture management.
- Reduce particulate emissions into the atmosphere.
- Minimize and reduce soil compaction.

**CONDITIONS WHERE PRACTICE APPLIES**

On 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, and planting methods 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.

Federally recognized noxious weeds or state recognized non-native (exotic, non-indigenous), invasive species shall not be used.

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**

Cover crop establishment, in conjunction with other practices, will be timed 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.

The amount of surface and/or canopy cover needed from the cover crop shall be determined 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 will be terminated as late as feasible to maximize plant biomass production, considering the time needed to prepare the field for planting the next crop.

#### **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 precipitation that can cause nutrient leaching.

Cover crop species will be selected for their ability to take up large amounts of nutrients from the rooting profile of the soil.

When used to redistribute nutrients from deeper in the 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 moment to kill the cover crop will depend on the specific rotation, weather and objectives.

#### **Additional Criteria to Promote Biological Nitrogen Fixation**

Only legumes or legume-grass mixtures will be established as 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**

Cover crop species shall be selected that have different maturity dates, attract beneficial insects, 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.

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

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 the subsequent crop.

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**

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 Reduce Particulate Emissions into the Atmosphere**

Manage cover crops and their residues so that at least 80% ground cover is maintained during planting operations for the following crop.

#### **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 crop in a timely matter to establish a good stand.

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.

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 attract pest 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. Use cover crops to break pest cycles.

Use cover crops to recycle nutrients in the soil.

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:

- Species or species of plants to be established.
- Seeding rates.
- Recommended seeding dates.
- Establishment procedure.
- Planned rates and timing of nutrient application.
- Planned dates for destroying 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 aerially 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.

#### REFERENCES

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Bowman, G.C. Cramer, and C. Shirley. A. Clark (ed.). 1998. Managing cover crops profitably. 2nd ed. Sustainable Agriculture Network Handbook Series; bk 3. National Agriculture Library. Beltsville, MD.

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.

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

<b>TABLE 1A</b>				
<b>LATEST SEEDING DATES FOR ESTABLISHING CEREAL RYE COVER - CONNECTICUT</b>				
		SEEDING RATES / ACRE		“GRAIN” RYE*
LOCATION		POUNDS	BUSHELS	SEEDING DATES
1.	<b>MLRA 144 UPLANDS ABOVE 1,000 FEET ELEVATION AND ANY DEPRESSIONAL F ROST POCKETS</b>	112	2	UP TO SEPTEMBER 15
		140	2.5	SEPTEMBER 16 TO SEPTEMBER 25
2.	<b>MLRA 144 BELOW 1000 FEET ELEVATION AND MORE THAN FIVE MILES INLAND</b>	112	2	UP TO SEPTEMBER 15
		140	2.5	SEPTEMBER 16 TO OCTOBER 1
3.	<b>MLRA 145 AND COASTAL AREAS IN MLRA 144 UP TO FIVE MILES INLAND</b>	112	2	UP TO SEPTEMBER 30
		140	2.5	OCTOBER 1 TO OCTOBER 10

**\* IN CONNECTICUT - 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**