

**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.

The seed rates for individual species in the mixture will be calculated by multiplying the desired percent of the species by the full seeding rate recommended by the Illinois Cover Crop Selection Tool.

**PURPOSES**

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

Seed planted with broadcast methods after primary crop harvest shall be incorporated with a harrow, cultipacker, roller, or vertical tillage tool to achieve adequate seed soil contact.

Cover crop(s) seeded prior to the harvest of the primary crop shall limit the damage to the standing crop. Seeding of cover crops into soybeans should not be done until the leaves are turning yellow at approximately growth stage R7-R8.

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

**CONDITIONS WHERE PRACTICE APPLIES**

All lands requiring vegetative cover for natural resource protection and or improvement. Grain production is not a purpose of the Cover Crop Practice.

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

**CRITERIA**

**General Criteria Applicable to All Purposes**

Plant species, seeding rates, seeding dates, seeding depths will be determined using the Illinois Cover Crop Selection Tool.  
<http://www.mccc.msu.edu/selectorINTRO.html>

Herbicides used with cover crops will be compatible with the following crop. Herbicides used for a main crop will be selected to be compatible with the planned cover crop species. Do not use plant species that are on the Illinois noxious weed lists.

Cover crop residue will not be burned.

Customized cover crop seed mixtures may be developed by selecting individual species listed in the Illinois Cover Crop Selection Tool.

Planting dates for wheat cover crops will observe the Hessian Fly free dates shown in the current Illinois Agronomy Handbook.

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](#).

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1. For all situations where a subsequent spring crop is to be planted, termination timing and method(s) will be planned after adequate growth has occurred to accomplish the intended benefit, and
2. Prior to potential detriment to the subsequent crop, and
3. Prior to risk of excessive soil moisture depletion.

Cover crops may only be grazed in a manner that retains or enhances the planned purpose(s).

Grazing will be secondary to the purpose(s) listed in the section of this standard titled "Purposes". Cover crops planned to be grazed will be established according to seed rates listed in the IL Forage and Biomass Planting Practice (512) for annual planted forages. Grazing will be implemented according to the guidelines established in the IL Prescribed Grazing Practice (528), and will include at least one over-wintering species in the seed mixture(s).

In addition to other criteria for non-irrigated cover crop termination, the cover crop termination must be at or before the time periods specified in the "NRCS Cover Crop Termination Guidelines-Non-Irrigated Cropland."

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

Establish cover crop in conjunction with other practices, so that the soil will be adequately protected during the critical erosion period(s). Do not use establishment methods that entail pre-plant tillage seedbed preparation after mid-October. Broadcast seeding followed by incorporation with a harrow, cultipacker, roller, or vertical tillage is permissible after mid-October.

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

Determine the amount of surface and/or canopy cover needed from the cover crop using RUSLE 2.

Where a subsequent spring crop is to be planted, termination timing and method(s) will be planned:

1. After adequate growth has occurred to provide enough biomass to protect the soil surface, and
2. Prior to potential detriment to the subsequent crop, and
3. Prior to risk for excessive soil moisture depletion.

#### **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.

Use the NRCS Soil Conditioning Index (SCI) procedure contained in RUSLE 2 to determine the amount of biomass and/or residue cover required for 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, meet crop insurance criteria, allow the time needed to prepare the field for planting the next crop, and prevent nitrogen immobilization and soil moisture depletion.

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

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

Cover crops will be established and actively growing before the expected period(s) of nitrate leaching.

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. When used to cycle nutrients, account for the interaction between carbon/nitrogen ratios of the selected species and the kill date in order to match the release of the nutrient(s) with

uptake by the following cash crop. To maximize uptake of excess plant nutrients, suitable cover crops should follow each crop in the crop rotation.

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

Use legumes or legume-grass mixtures.

The specific Rhizobia bacteria for the selected legume will either be present in the soil or the seed will be inoculated at the time of planting. Legume species not grown within the previous 3 years shall be inoculated. Refer to Illinois Agronomy Technical Note Number 20 for additional information.

#### **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 (allelopathy) or physical characteristics to suppress or compete with weeds.

Higher seeding rates to provide additional cover may help control weeds to eliminate or reduce herbicide use. In most cases, cover crop residue will not provide broad spectrum, season long weed control.

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

#### **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 but prior to reaching a growth stage that will be detrimental to the subsequent crop due to allelopathy or nitrogen immobilization

#### **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**

Use deep-rooted species to maximize nutrient recovery.

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

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

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

A late termination may be used if the objective is to use the cover crop as a biocontrol.

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

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 Sheet 340, on printouts from the Illinois Cover Crop Selector tool, or on other forms.

#### **OPERATION AND MAINTENANCE**

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; 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.

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