

**Natural Resources Conservation Service
Conservation Practice Standard**

**Cover and Green Manure Crop
Code 340 (Acre)**

DEFINITION

Grasses, legumes, forbs, or other herbaceous plants established for seasonal cover and conservation purposes.

PURPOSES

1. Reduce erosion from wind and water
2. Increase soil organic matter
3. Manage excess nutrients in the soil profile
4. Promote biological nitrogen fixation
5. Increase biodiversity
6. Weed suppression
7. Provide supplemental forage
8. Soil moisture management

CONDITION WHERE PRACTICE APPLIES

On all lands requiring vegetative cover for natural resource protection

CRITERIA

General Criteria Applicable To All Purposes

1. Plant species, seedbed preparation, seeding rates, seeding dates, seeding depths, and planting methods will be consistent with approved local criteria and site conditions.
2. The species selected will be compatible with the nutrient management and pest management provisions of the plan.
3. Cover crops will be terminated by harvest, frost, mowing, tillage, and/or herbicides in preparation for the following crop.
4. Herbicides used with cover crops will be compatible with the following crop.
5. Cover crop residue will not be burned.
6. Prepare a suitable seedbed or no till the seed. If seeded immediately after the last cultivation, frost seeded, or aerial seeded then no seedbed preparation is necessary. When broadcasting or aerial seeding into a standing crop (to be harvested) do not use treated seed.
7. For the legume cover/green manure mixtures, use the appropriate inoculate or preinoculated seed if that particular legume has not been grown on this site within the last five (5) years.

**Section IV, FOTG
Standard 340
June 2002**

8. Seed Mixtures for Cover/Green Manure Following Row and Vegetable Crops:

Mixture	Rates	Seeding Dates *
Wheat	1.5 – 2.5 bu/ac (90 – 150 lbs/ac)	After Local Fly Safe Date until October 20
Rye	1.5 – 2.5 bu/ac (90 – 150 lbs/ac)	August 1 to November 1
Oats	1.5 – 2.5 bu/ac (48 – 80 lbs/ac)	August 1 to October 10
Annual Ryegrass	15 – 20 lbs/ac	August 1 to October 10

*Aerial seeding should be accomplished by September 15th

9. Seed Mixtures for Cover/Green Manure Following Small Grains (Preharvest and Postharvest):

Mixture	Rates	Preharvest Seeding Dates	Postharvest Seeding Dates
Red Clover	8 – 10 lbs/ac	Feb 1 – March 15	August 1 – September 15
Sweetclover	10 – 12 lbs/ac	Feb 1 – March 15	August 1 – September 15
Mix of Red & Sweetclover	10 – 12 lbs/ac	Feb 1 – March 15	August 1 – September 15
Hairy Vetch	15 – 20 lbs/ac		August 1 – September 15
Alfalfa	10 – 15 lbs/ac	Feb 1 – March 15	August 1 – September 15
Soybeans	50 – 100 lbs/ac		From Small Grain Harvest to August 1

10. Seed Mixture for Cover/Green Manure for Summer Cover or Conservation Use Land:

Mixture	Rates	Seeding Dates
Annual or Perennial Ryegrass	15 – 20 lbs/ac	March 15 to June 1
Oats	1.5 – 2.5 bu/ac (48 – 80 lbs/ac)	March 15 to August 1
Alfalfa	10 – 12 lbs/ac	March 15 to May 15
Red Clover	8 – 10 lbs/ac	March 15 to May 15
Sweetclover	10 – 12 lbs/ac	March 15 to May 15
Red and Sweetclover Mix	10 – 12 lbs/ac	March 15 to May 15
Grain Sorghum or Sudax	20 – 25 lbs/ac	May 1 to July 15
Soybeans	50 – 100 lbs/ac	May 1 to August 1

11. Mixtures for Orchards, Vineyards, and Nursery Cover:

Mixture	Rates	Seeding Dates
Wheat (Temporary)	1.5 – 2.5 bu/ac (90 – 150 lbs/ac)	After Local Fly Safe Date until October 20
Rye (Temporary)	1.5 – 2.5 bu/ac (90 – 150 lbs/ac)	August 1 to November 1
(Temporary or Permanent) Bluegrass plus Timothy	5 – 10 lbs/ac 3 – 5 lbs/ac	August 1 to September 15
(Temporary or Permanent) Ladino Clover	0.5 – 0.75 lbs/ac	August 1 to September 15
(Temporary or Permanent) Bluegrass plus Ladino Clover	5 – 10 lbs/ac 0.25 – 0.5 lb/ac	August 1 to September 15

Additional Criteria to Reduce Erosion From Wind and Water

1. 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).
2. Plants selected for cover crops will have the physical characteristics necessary to provide adequate protection.
3. The amount of surface and/or canopy cover needed from the cover crop shall be determined using current erosion prediction technology.
4. When using wheat or rye cover/green manure crops do not till the cover crop until it either reaches a height of 10 inches in the spring or any time after May 1st.
5. When using ryegrass or legumes as the cover/green manure crop do not till the cover crop until it reaches a height of 6-8 inches or after May 1st.

Additional Criteria to Promote Biological Nitrogen Fixation

1. The specific Rhizobia bacteria will either be present in the soil or the seed will be inoculated at the time of planting legumes.
2. Nitrogen credits from legume cover crops will be accounted for in the nutrient management plan.

Additional Criteria to Manage Excess Nutrients in the Soil Profile

1. Cover crops will be established and actively growing before expected periods of high precipitation that can cause leaching.
2. Cover crop species will be selected for their ability to absorb large amounts of nutrients from the rooting profile of the soil.

Additional Criteria to Increase Soil Organic Matter

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

2. The NRCS Soil Conditioning Index (SCI) procedure will be used to determine the amount of biomass required.
3. The cover crop will be terminated as late as feasible to maximize plant biomass and still prepare the seedbed for the subsequent crop.

Additional Criteria to Increase Biodiversity

- ◆ Cover crop species shall be selected that, have different maturity dates, attract beneficial insects, serve as a trap crop for damaging insects, and/or provide food and cover for wildlife habitat management.

Additional Criteria for Weed Suppression

1. Species for the cover crop will be selected for their chemical or physical competition with weeds.
2. Cover crops residues will be left on the soil surface to maximize allelopathic (chemical) and mulching (physical) effects.
3. For long-term weed suppression, perennials and/or biennial species can be used.

Additional Criteria to Provide Supplemental Forage

1. Species selected will have desired forage traits, be palatable to livestock, and not interfere with the production of the subsequent crop.
2. 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

1. Terminate growth of the cover crop sufficiently early to conserve soil moisture for the subsequent crop.
2. Cover crops established for moisture conservation shall be left on the soil surface until the subsequent crop is planted.
3. In areas of potential excess soil moisture, allow the cover crop to grow as long as possible to optimize soil moisture removal.

CONSIDERATIONS

1. The cover crop should be terminated as late as feasible to maximize plant growth and still prepare the seedbed for the subsequent crop.
2. Deep-rooted species provide maximum nutrient recovery.
3. Consider that grasses utilize more soil nitrogen, and legumes utilize both nitrogen and phosphorus.
4. Avoid cover crop species that attract potentially damaging insects.
5. Acceptable benefits, for most purposes, are usually accomplished when the plant density is at least 25 stems per feet, the combined canopy and surface cover is at least 60 percent, and the above ground (dry weight) biomass production is at least 2700 lb/acre.

Section IV, FOTG
Standard 340
June 2002

6. Cover crops may be used to improve site conditions for establishment of perennial species.
7. Consider potential herbicide carryover when selecting the species of the cover/green manure crop. Plan the use of herbicides that will not restrict the use of the planned cover crop.
8. Grass cover/green manure crops (especially cereal rye) are more effective in utilizing excess nitrogen remaining from the previous crop. The aboveground biomass may be removed from the field for maximum nutrient removal efficiency.
9. Cereal rye will grow longer in the fall and begin growth earlier in the spring than wheat.
10. An aerial seeded oats cover crop into soybeans (seeded prior to harvest) can add additional residue cover without the need to kill the cover crop in the following spring.
11. Aerial seeded cover crops into soybeans, especially wheat, rye, and oats, are best if seeded prior to soybean leaf drop. This generally occurs the last week of August to mid-September. **DO NOT SEED WHEAT PRIOR TO THE FLY SAFE DATE TO AVOID AN INFESTATION OF THE HESSIAN FLY. DO NOT USE TREATED SEED WHEN BROADCASTING OR AERIAL SEEDING INTO A STANDING CROP.**
12. Aerial seeded wheat or cereal rye into corn is best if seeded during the early dent stage. This generally occurs the last week of August to mid-September. **DO NOT SEED WHEAT PRIOR TO THE FLY SAFE DATE TO AVOID AN INFESTATION OF THE HESSIAN FLY. DO NOT USE TREATED SEED WHEN BROADCASTING OR AERIAL SEEDING INTO A STANDING CROP.**
13. Grass type cover/green manure crops should be considered when a legume crop, e.g. soybeans, is planned following the cover crop.
14. Legume type cover/green manure crops should be considered when a grass crop, e.g. corn, is planned following the cover crop.
15. It is critical that grass cover/green manure crops be controlled or killed when planting a grass crop such a corn. Grass cover crops, especially cereal rye, can produce an allelopathic effect that can slow the germination and growth of corn and other grass crops/weeds. It is best to kill the grass cover about a week prior to planting the corn crop.
16. Hairy Vetch and clovers can serve as a host to the Soybean Cyst Nematode (SCN). Consider alternative cover crops when SCN is a concern in the rotation. Other SCN host plants include: henbit, common mullen, wild mustard, chickweed, pokeweed, and canola.
17. Aerial seeded and early no-till established cover crops provide more erosion control the year of establishment.
18. Cover crops established after considerable soil disturbance in the fall or seeded after October 10th can cause more erosion during the year of establishment than if no cover crop were planted.
19. Cover crops should be considered on fields following corn silage to reduce wind and water erosion and to replace organic matter losses.

NRCS - Ohio
June 2002
Standard 340 - Page 5

20. Cover crops following corn silage or soybeans generally provide most of their erosion protection the spring (year) after establishment when allowed to mature to the heights specified in the criteria. No till and mulch till systems compliment the use of cover crops.

PLANS AND SPECIFICATIONS

Specifications for establishing, operation / management, and maintenance of cover/green manure crops shall be prepared for each field according to the Criteria, Considerations, and Operation / Management and Maintenance described in this standard, and shall be incorporated into narrative statements in the conservation plan, recorded on jobsheets, or other suitable forms that adequately describe establishment, operation / management and maintenance. The minimum documentation requirements can be found on the last page of this standard.

OPERATION / MANAGEMENT AND MAINTENANCE

1. Control growth of the cover crop to reduce competition from volunteer plants and shading.
2. Control weeds in the cover crop by mowing or herbicide application.
3. When seeding legumes, ensure the proper inoculate is used at planting time. It is best to inoculate just prior to planting.
4. Do not use treated seed when broadcasting or aerial seeding in a crop to be harvested.
5. Establish the cover/green manure crop within the stated time period and maintain until the stated time/growth stage.

REFERENCES:

National Practice Standard Cover and Green Manure Crops (340), February 2000
Ohio Agronomy Manual, 13th Edition
Jobsheet 340

Practice Documentation For: <i>Cover and Green Manure Crop - 340</i>
The following documentation must be in the case folder or engineering subfolder.
Practice Planning
<ol style="list-style-type: none"> 1. Is the practice part of a conservation plan? 2. Have the purpose(s) for the practice been identified? 3. Is the location of the practice identified on a map or plan drawing?
Practice Design
<p>Have the following design criteria been addressed?</p> <ol style="list-style-type: none"> 1. Seeding mixture, rate, timing, and method of establishment. 2. Timing or maturity of the cover before tillage or killing of the cover. 3. The amount of cover (% or pounds) expected from the cover.
Practice Installation / Application
<p>Does the practice meet the minimum criteria for the planned purpose(s)?</p> <p>Have the following criteria been documented in the assistance notes or practice jobsheet?</p> <ol style="list-style-type: none"> 1. Type of cover established. 2. Condition of the cover. 3. Acres established.
Practice Deficiencies
<p>If applicable, have the practice deficiencies been communicated with the decisionmaker?</p>
Practice Maintenance
<p>Have the following maintenance actions been communicated to the decisionmaker?</p> <ol style="list-style-type: none"> 1. Control weeds in the cover crop by mowing or herbicide application. 2. Control growth of the cover crop to reduce competition from volunteer plants and shading.
<p>Other Comments:</p>