



Practice Specification Cover Crop (Code 340)

1. SCOPE

(a) This work shall consist of, selecting species, preparing a seedbed, furnishing and placing lime, fertilizer, and seed on all areas shown on the conservation plan map for the purpose of establishing and managing temporary vegetative cover that will meet the objectives specified in the conservation plan.

2. MATERIALS

Grow cover crops on certified organic cropland using materials that are National Organic Program approved and meet minimum requirements outlined below.

(a) Seed:

All seed must conform to the current rules and regulations of New York State Agriculture and Markets and meet or exceed the standards for purity and germination (adjust to a minimum of 85% or PLS (pure live seed)). Use seed with a test date no more than 9 months old. Use only seed fully tagged or certified by a commercial supplier or seed testing lab. Do not use seed that has become wet, moldy or otherwise damaged in transit or storage.

(b) Inoculants:

The inoculant for treating legume seeds shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species.

(c) Lime:

Apply Standard Ground Agricultural Limestone, or approved equivalent meeting current requirements of the New York State Department of Agriculture and Markets as indicated by soil tests.

(d) Fertilizer:

Use only commercial grade fertilizer that meets the standard for grade and quality specified by NYS State Law. Document fertilizer analysis and weight from supplier.

3. SPECIES SELECTION

(a) Select single species or species mix from the NY NRCS Cover Crop Seed Calculator Worksheet that will meet the purpose of the cover crop documented in the site specific conservation plan. Ensure that cover crop species selected have the proper growth and bio-mass production characteristics that will be specific to the time period(s) needing resource protection or enhancement for the site. Species available in the seed calculator assume typical cropland soil conditions with adequate natural or artificial soil drainage.

4. COVER CROP SEEDING

(a) Application of Soil Amendments:

Apply lime, fertilizer, manure and other organic by products using rates, form, timing and method based on current soil test results and Cornell University Guidelines.

(b) Timing of Seeding:

Table 1 provides optimal and latest seeding dates for the primary season requiring cover crops by USDA Plant Hardiness Zone. For fall/winter cover crops, refer to the USDA Plant Hardiness Zone Maps to determine the corresponding optimal and latest seeding date for the specific location of the cover crop establishment <http://planthardiness.ars.usda.gov/PHZMWeb/>. Refer to footnote 2 on table 1 for definitions of early and late seeding for fall/winter cover crop dates to use in the NY NRCS Cover Crop Seed Rate Calculator Worksheet. Determine the latest seeding date for mixes based on the species in the mix that has the earliest required latest seeding date unless otherwise noted. Where seeding date exceeds the latest allowed date in table 1 for selected species as footnoted, cover crop performance must be monitored, measured, and documented to determine (when reasonable soil moisture is available) when to

terminate the cover crop to ensure above ground biomass is on target for growth compared to planned or modeled biomass levels. Use direct biomass measurements or an accepted cover/height correlation chart to determine biomass levels.

(c) Seedbed Preparation:

Provide an adequate seedbed to ensure seed/soil contact and adequate weed control for successful cover crop establishment. Incorporate the seed into the soil at the recommended seeding depth for the species from table one. Use harrows, field cultivators, disks, no-till drills, culti-mulchers or similar tillage equipment that disturb the soil and result in seed incorporation to the recommended depth. For cover crop mixes, the seedbed should be culti-packed after seeding to the proper depth. If culti-packing is not an option, increase the seed mix rate by selecting the correct option in the seed rate calculator. Discontinue seedbed preparation when soil moisture conditions are not suitable for the preparation of a satisfactory seedbed, or when equipment use will compact the soil.

The seedbed must be determined not to have herbicide carry over action from main crop herbicide treatments that could be detrimental to cover crop establishment and growth.

Use broadcast and aerial seeding without soil incorporation only in standing crops where soil incorporation is not practical. If broadcast seeding without incorporation is the only option due to a standing crop, time the seeding to coincide with optimum soil surface conditions that will result in seed-soil contact. Such conditions include:

- moist, loose, friable, weed free soil immediately prior to main crop leaf drop, residue additions from harvest, or other additions of surface organic matter including manure;
- loose, friable, weed free, un-compacted soil surface when adequate soil moisture is present or precipitation imminent;
- during surface freeze thaw cycles with appropriate species and seed type.

On non-cropland sites where equipment cannot operate, prepare the seedbed by hand or other means to ensure adequate seed/soil contact.

(d) Seeding Rates:

Minimum seeding rates will be determined by using the NY NRCS Cover Crop Seed Rate Calculator Worksheet based on species, species mix make up if applicable, seeding method, and cover crop purpose. The NY NRCS Seeding Rate Calculator will adjust seeding rates for selected species based on the correct user input options.

Where the purpose of the cover crop will be forage production, seed at rates provided by Cornell Guidelines for forage production.

(e) Seed Inoculation:

Inoculate legumes with the proper fresh culture no more than 8 hours prior to sowing unless pre-inoculated coated seed is used. If hydro-seeding is used, inoculate immediately prior to hydro-seeding. Use four times the recommended inoculant when hydro-seeding. Do not use inoculants after labeled expiration date. Store the inoculant according to manufacturer's recommendations until ready for use. Use a mixing medium recommended by the manufacturer to bond the inoculant to the seed. When used with hydraulic seeding equipment with fertilizer in the mix, add the inoculant to the mix last so not remain in the seeder longer than 4 hours.

(f) Inter-seeding:

Inter-seed cover crops into a growing crop immediately before; or simultaneously with cultivation or side dress incorporation of nitrogen allowing for seed/soil contact at recommended seeding depth. Soil disturbance should be between all rows. Herbicides used for the primary crop must be compatible with the inter-seeded cover crop. Broadcast or seed drop inter-seeding without soil incorporation will follow broadcast requirements in 4(c) Seedbed Preparation above. Time inter-seeded cover crops so as not to adversely affect growth, development, and agronomic management of main crop. Cover Crop inter-

seeding shall coincide with crop stages that allow for adequate sun light penetration to provide successful cover crop establishment and survival for the cover crop species selected. For corn this is prior to the V5 stage or after canopy opening after main crop reaches physiological maturity. For early cover crop inter-seeding, select species that will survive maximum canopy shading of the main crop (for species shade tolerance refer to footnotes in table 1).

(g) Seeding Depth:

Follow seeding depths specified in table 1 for selected species or follow the specification for un-tilled broadcast seeding 4(c) Seedbed Preparation above.

5. TERMINATION OF COVER CROPS

Terminate cover crops by frost, forage harvest or grazing, roller crimping, tillage, and/or with proper herbicide selection. Timing of cover crop termination must meet the purpose of the cover crop as specified in the conservation plan. Timing of cover crop termination may affect the performance of the subsequent main crop. Refer to NRCS Cover Crop Termination Guidelines for potential conflicts for cover crops and any USDA insured main crops. Consider soil moisture depletion, nitrogen immobilization, synchrony of N utilization, allelopathy, and unwanted re-seeding potential when timing cover crop termination. Manage cover crop surface residue and biomass production to meet objectives specified in the conservation plan. In vineyards and small fruit operations, grow cover crop in aisles, mow as necessary for mulch cover and maintain as short stubble as applicable. Adjust nitrogen application rates for the subsequent crop based on nitrogen credits or potential N immobilization for specific cover crop species from Land Grant University nutrient guidelines.

(a) Herbicide Termination:

A NYS Certified Pesticide Applicator, Certified Crop Advisor or qualified Extension Specialist can make herbicide recommendations. Follow all pesticide labeling requirements/restrictions. All Herbicides must be compatible with the main crop grown in association with the cover crop.

(b) Winter Kill Termination:

Achieve planned cover and biomass production levels for the specific cover crop purpose from the conservation plan prior to termination by frost or winter kill. Use only winter hardy cover crops when the objective of the conservation plan is to allow late fall manure applications to high Nitrogen Leaching Index (NLI) soils as winter kill terminated cover crops may not provide adequate nitrogen uptake.

(c) Grazing/Haying Termination:

Cover crops grazed or harvested for forage as a termination method will have a specified amount of target residual biomass left in the field to meet the cover crop objective(s) outlined in the conservation plan. Employ additional termination methods as needed once grazing/haying has concluded. Identify and consider potential adverse reactions from cover crop consumption by grazing and forage fed animals. Monitor grazing/fed livestock at all times for any adverse reactions from cover crop forage.

(d) Tillage Termination:

Use tillage implements that will provide adequate soil disturbance to kill the cover crop. Evaluate all tillage disturbance in relation to soil loss and soil health objectives using current erosion prediction technology.

(e) Roller/Crimper Termination:

Rolling/crimping will take place at the proper cover crop growth stage to limit regrowth potential. For small grains this stage is at the anthesis or grain head stage, for legumes the flowering stage. Direction of rolling/crimping will coincide with planting direction when no-till planting the subsequent crop.

6. ADDITIONAL CONDITIONS

(a) Document additional conditions on a site specific NY 340 Cover Crop Implementation Requirement document. Technical Specialists with Cover Crop Job Approval Authority can approve additions and substitutions to this specification.

Table 1-New York Cover Crop Seeding dates by Hardiness Zone							
Cover Crop Species ³		Spring/ Summer Cover- All Zones	Fall/winter Cover- Zone 3b-5a	Fall/ Winter Cover-Zone 5b	Fall/winter Cover Zone 6a- 6b	Fall/Winter Cover-Zone 7a and above	Rec Seeding Depth (inches)
Winter Hardy Small Grains							
Winter Rye (certified Aroostook) ^{1,2,5,11}	Optimal	NA	Sept 15	Sept 20	Sept 25	Sept 30	.75-2
	Latest ⁴	NA	Oct 15	Oct 20	Oct 25	Oct 31	
Winter Rye (common) /Winter Wheat/Winter Triticale ^{2,5,11}	Optimal	NA	Sept 15	Sept 20	Sept 25	Sept 30	.5-1.5
	Latest ⁴	NA	Oct 10	Oct 15	Oct 20	Oct 25	
Spring Small Grains							
Oats ⁹ /Barley ^{2,5,10,11} / Spring Small Grain	Optimal	April 15	Sept 1	Sept 5	Sept 10	Sept 15	.5-1.5
	Latest	May 30	Sept 20	Sept 25	Sept 30	Oct 5	
Cool Season Grasses							
Ryegrass ^{2,5,11} annual or perennial	Optimal	April 15	Aug 15	Aug 20	Aug 25	Sept 1	.12-.5
	Latest	May 15	Sept 15	Sept 20	Sept 25	Sept 30	
Orchard Grass ^{2,11}	Optimal	April 15	Aug 15	Aug 20	Aug 25	Sept 1	.12-.5
	Latest	May 15	Sept 5	Sept 10	Sept 15	Sept 20	
Warm Season Grasses ^{5,6,9}							
Sorghum-Sudan Grass Hybrids ⁵	Optimal	June 1	June 1	June 1	June 1	June 1	.5-1.5
	Latest	July 1	Aug 10	Aug 15	Aug 20	Aug 25	
Sudan Grass	Optimal	June 1	June 1	June 1	June 1	Aug 25	.5-1.5
	Latest	July 1	Aug 10	Aug 15	Aug 20	Aug 25	
Japanese Millet	Optimal	June 1	June 1	June 1	June 1	June 1	.5-1.0
	Latest	July 1	Aug 10	Aug 15	Aug 20	Aug 25	
Pearl Millet	Optimal	June 1	June 1	June 1	June 1	June 1	.5-.75
	Latest	July 1	Aug 10	Aug 10	Aug 20	Aug 25	
German Foxtail Millet	Optimal	June 1	June 1	June 1	June 1	June 1	.5-1.5
	Latest	July 1	Aug 10	Aug 15	Aug 20	Aug 25	
Dwarf BMR Millet	Optimal	June 1	June 1	June 1	June 1	June 1	.5-1.5
	Latest	July 1	Aug 10	Aug 15	Aug 20	Aug 25	

Cover Crop Species ³		Spring/ Summer Cover- All Zones	Fall/winter Cover- Zone 3b-5a	Fall/ Winter Cover-Zone 5b	Fall/winter Cover Zone 6a- 6b	Fall/Winter Cover-Zone 7a and above	Rec Seeding Depth (inches)
Brassicas ⁹							
Daikon Radish ^{5,11}	Optimal	April 15	Aug 10	Aug 15	Aug 20	Aug 25	.25-.5
	Latest	May 15	Sept 1	Sept 5	Sept 10	Sept 15	
Canola Winter ⁵	Optimal	April 15	Aug 20	Aug 25	Sept 1	Sept 5	.25-.75
	Latest	May 15	Sept 10	Sept 15	Sept 20	Sept 25	
Turnip Purple Top	Optimal	April 15	Aug 5	Aug 10	Aug 15	Aug 20	.25-.75
	Latest	May 15	Aug 25	Sept 1	Sept 5	Sept 10	
Dwarf Essex Rape ⁵	Optimal	April 15	Aug 10	Aug 15	Aug 20	Aug 25	.25-.75
	Latest	May 15	Sept 1	Sept 5	Sept 10	Sept 15	
Hybrid Turnip/Rape BR ⁵	Optimal	April 15	Aug 10	Aug 15	Aug 20	Aug 25	.25-.75
	Latest	May 15	Sept 1	Sept 5	Sept 10	Sept 15	
Mustard ¹¹	Optimal	April 15	Aug 5	Aug 15	Aug 15	Aug 20	.25-.75
	Latest	May 15	Sept 5	Sept 15	Sept 20	Sept 25	
Cool Season Legumes							
Red Clover ^{5,7,11}	Optimal	April 15	Aug 1	Aug 5	Aug 10	Aug 15	.25-.5
	Latest	NA	Aug 20	Aug 25	Sept 1	Sept 5	
Yellow Sweet Clover ⁵	Optimal	April 15	Aug 1	Aug 5	Aug 10	Aug 15	.25-1.0
	Latest	May 15	Aug 15	Aug 20	Aug 25	Sept 1	
Alfalfa ^{5,7}	Optimal	April 15	Aug 1	Aug 5	Aug 10	Aug 15	.25-.5
	Latest	May 15	Aug 15	Aug 20	Aug 25	Sept 1	
Crimson Clover ^{4,6,10,11}	Optimal	April 15	Aug 1	Aug 5	Aug 10	Aug 15	.25-.5
	Latest	May 15	Aug 20	Aug 25	Sept 1	Sept 5	
White Clover VNS ¹¹	Optimal	April 15	Aug 1	Aug 5	Aug 10	Aug 15	.25-.5
	Latest	May 15	Aug 15	Aug 20	Aug 25	Sept 1	
Spring Pea ⁹	Optimal	April 15	Aug 1	Aug 5	Aug 10	Aug 15	1.0-2.0
	Latest	May 1	Aug 15	Aug 20	Aug 25	Sept 1	
Winter Peas ^{8,10,12}	Optimal	April 15	Aug 15	Aug 20	Aug 25	Sept 1	1.0-2.0
	Latest	May 1	Sept 1	Sept 5	Sept 10	Sept 15	
Hairy Vetch ^{5,12}	Optimal	April 15	Aug 15	Aug 20	Aug 25	Sept 1	.5-1.5
	Latest	May 1	Sept 1	Sept 5	Sept 10	Sept 15	
Warm Season Legumes ⁹							
Cowpea ^{5,6}	Optimal	June 1	June 1	June 1	June 1	June 1	1.0-2.0
	Latest	July 1	July 5	Aug 1	Aug 5	Aug 10	
Soybean Conv. ⁶	Optimal	June 1	June 1	June 1	June 1	June 1	1.0-2.0
	Latest	July 1	July 20	July 25	Aug 1	Aug 5	
Sun Hemp ^{5,6}	Optimal	June 1	June 1	June 1	June 1	June 1	.5-1.5
	Latest	July 1	July 20	July 25	Aug 1	Aug 5	

Cover Crop Species ³		Spring/ Summer Cover- All Zones	Fall/winter Cover- Zone 3b-5a	Fall/ Winter Cover-Zone 5b	Fall/winter Cover Zone 6a- 6b	Fall/Winter Cover-Zone 7a and above	Rec Seeding Depth (inches)
Cool Season Broadleaves							
Phacelia	Optimal	April 15	Aug 5	Aug 10	Aug 15	Aug 20	.125-.25
	Latest	May 15	Aug 15	Sept 1	Sept 5	Sept 10	
Chicory	Optimal	April 15	Aug 5	Aug 10	Aug 15	Aug 20	.25-.5
	Latest	May 15	Aug 15	Sept 1	Sept 5	Sept 10	
Warm Season Broadleaves ⁹							
Buckwheat	Optimal	June 1	June 1	June 1	June 1	June 1	.5-1.5
	Latest	July 15	Aug 5	Aug 10	Aug 15	Aug 20	
Sunflower	Optimal	June 1	June 1	June 1	June 1	June 1	1.0-2.0
	Latest	July 1	July 25	Aug 1st	Aug 5	Aug 10	
Table 1 Footnotes							
1-NRCS NY recommends the use of Aroostook Rye over Common Rye Variety Not Stated (VNS) for late planting and higher biomass objectives when rolling for termination. For mixes use common Rye. Use shorter statured cereal rye grain varieties or other small grains in mixes, especially with legume mixes.							
2-The New York NRCS Cover Crop Seed Rate Calculator Worksheet defines early seeding as before and up to 5 days after the optimal fall/winter date listed. Late seeding is 5 days after optimal until latest date listed on table 1. The early seeding date option for reduced seeding rates apply only to cool season grains or cool season grass planted as a monoculture.							
3-The New York NRCS Cover Crop Seed Rate Calculator Worksheet reduces or increases seeding rate for selected species depending on cover crop purpose, tillage system used for subsequent main crop, and method of cover crop seeding.							
4-These species may meet performance objectives if planted after latest allowed date in some years. In order to document planned cover crop performance, monitor and measure cover crop cover and biomass levels for the time period and purpose specified in the conservation plan when these species are planted after the latest allowed date.							
5-Considered deep rooted and will have a higher benefit for compacted soils							
6-Do not plant before soil temperatures reach 55 Degrees F							
7-Frost seeding allowed into winter small grain during early spring coinciding with daily freeze-thaw cycles							
8 Allow Planting 10 days later when in a mix with short statured cereal grains.							
9-Species will likely frost or winter kill in most regions in New York							
10-Species may winter kill in colder regions of New York, check variety for winter hardiness							
11-Species has shade tolerance which will be applicable if inter-seeded into growing crops							
12- Drill cover crop only.							

References:

SARE, Cover Crops Profitably-Handbook Series Book 9, Third Edition

USDA-Agricultural Research Service-Plant Hardiness Zone Maps

<http://planthardiness.ars.usda.gov/PHZMWeb/>

NRCS Cover Crop Termination Guidelines:

<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/climatechange/?cid=stelprdb1077238>

Specific Site Requirements