NATURAL RESOURCES CONSERVATION SERVICE
VEGETATIVE PRACTICE SPECIFICATION
340 – COVER CROP

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

Where Cover Crop is applied to certified organic cropland all materials will be National Organic Program approved and meet minimum requirements outlined below.

(a) Seed:
All seed shall conform to the current rules and regulations of New York State Agriculture and Markets and shall meet or exceed the standards for purity and germination of pure live seed (80% germination). No seed will be used with a date of test more than 9 months old. All seed shall be fully tagged or certified by a commercial supplier. Seed that has become wet, moldy or otherwise damaged in transit or storage shall not be used.

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

(c) Lime:
Lime shall consist of Standard Ground Agricultural Limestone, or approved equivalent. Standard Ground Agricultural Limestone is defined as ground limestone meeting current requirements of the New York State Department of Agriculture and Markets. Where lime is specified, an evaluation of potential adverse effects of pH dependent herbicide carry over will be conducted.

(d) Fertilizer:
Fertilizer, where required shall be a commercial grade fertilizer and meet the standard for grade and quality specified by NYS State Law. Where fertilizer is furnished from bulk storage, the supplier shall furnish certification of analysis and weight.

3. SPECIES SELECTION

(a) Select single species or species mix from the tables 1-3 that will meet the objectives of the site specific conservation plan. Ensure that cover crop species selected have the proper growth and bio-mass production characteristics that will complement the time period(s) needing resource protection or enhancement. Species outlined assume typical cropland soil conditions with adequate natural or artificial 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. Applications of soil amendments must meet the New York Nutrient Management (590) standard where applicable.

(b) Timing of Seeding:
The latest seeding dates for the primary season requiring cover crops are provided in tables 1-3. The dates in these tables are the base latest seeding dates for New York. For fall and winter cover crops only, refer to the USDA Plant Hardiness Zone Maps for latest seeding date adjustments based on specific location where cover crop will be planted. Locations within Hardiness Zones 3b-5a require the use of the base latest seeding dates listed in the tables 1-3. Latest fall and winter seeding dates may be adjusted from the latest base seeding dates relative to dates in tables 1-3 for the following USDA Plant Hardiness Zones due to warmer fall temperatures in these zones:

- up to 5 days later in plant hardiness zones 5b,
- up to 10 days later in zones 6a and 6b,
- and up to 15 days later in zones 7a and above,

The latest seeding date may be extended an additional 5 days in all regions when the primary purpose of the cover crop is documented as soil health and/or nitrogen fixation and the target biomass production is achieved and documented prior to cover crop termination.

(c) Seedbed Preparation:
The seedbed shall be adequate to ensure seed/soil contact and weed control for successful cover crop establishment. Prepare a seedbed by harrowing, cultivating, disking or no-till drilling where practical and effective. Seedbed preparation shall be discontinued when soil moisture conditions are not suitable for the preparation of a satisfactory seedbed or when equipment use will compact the soil. Broadcast and aerial seeding without tilling shall be used only in standing crops when seeding can be timed to coincide with optimum soil surface conditions that will result in seed-soil contact. Such conditions include:

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

Un-tilled broadcast seeding rates must be increased by a minimum of 30% from the tilled seeding rates listed in tables 1-3. On non-cropland sites where equipment cannot operate, the seedbed shall be prepared by hand or other means such that the surface is scarified and roughened so that seed will stay in place.

(d) 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. The inoculant shall be used no later than the date indicated on the container or as otherwise specified. Inoculant will be stored according to manufacturer's recommendations until ready for use. A mixing medium, as recommended by the manufacturer, shall be used to bond the inoculant to the seed. When used with hydraulic seeding equipment with fertilizer in the mix, the inoculant shall be added last and it shall not remain in the seeder longer than 4 hours.

(e) Inter-seeding:
Where the cover crop is to be inter-seeded with growing crop, seed cover crop after; or simultaneously with cultivation or side dress incorporation of nitrogen so as to improve seed/soil contact and maintain 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 inter-seeding without tilling will follow broadcast requirements in 4(c) Seedbed Preparation above. Inter-seeded cover crops must be timed so as not to adversely affect main crop growth and development.

(f) Seeding Depth:
Follow seeding depths specified in tables 1-3 for species and/or species mix selected or follow specification for un-tilled broadcast seeding 4(c) Seedbed Preparation above.

5. TERMINATION OF COVER CROPS

Cover crops will be terminated by frost, harvest or grazing for forage, roller crimping, tillage, and/or with proper herbicide selection. Timely termination of in season cover crops is required to reduce soil moisture depletion, nitrogen immobilization, allelopathy and to prevent unwanted re-seeding. Timing of cover crop termination must meet the purpose of the cover crop as specified in the conservation plan. 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. Adjust nitrogen application rates for the subsequent crop based on nitrogen credits for specific cover crop species from Land Grant University nutrient guidelines.

(a) Herbicide Termination:
Herbicide selection for termination must be made by a NYS Certified Pesticide Applicator, Certified Crop Advisor or qualified Extension Specialist following pesticide labeling and must be compatible with the following main crop to grown.

(b) Winter Kill Termination:
Insure that planned cover and biomass production levels can be achieved for the specific cover crop purpose from the conservation plan when using cover crop species that terminate by frost or winter kill. When the objective of the conservation plan is to allow fall manure applications to high Nitrogen Leaching Index (NLI) soils, winter kill termination is not an option and winter hardy cover crops must be used.

(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 and target biomass is achieved and documented. When cover crops are grazed, potential adverse reactions from cover crop consumption by grazing animals must be monitored at all times.

(d) Tillage Termination:
Use inversion type tillage implements that will adequately bury and kill the cover crop.

(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 boot 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. COMMON COVER CROPS, SEEDING RATES AND LATEST SEEDING DATE TABLES FOR NEW YORK

(a) The correct table used for species selection must correspond to the purpose outlined in a site specific conservation plan.

(b) Cover crops will be seeded no later than the dates shown on the appropriate table and adjusted as allowed based on item 4b. Planting at latest seeding date will result in a minimal cover crop performance level for the purpose given. For optimal cover crop establishment and growth, seed earlier than the latest seeding dates indicated.

(c) Seeding will be at rates no less than the seeding rate specified from the appropriate table. Seeding rates in the tables are for the seeding depths specified. Broadcast seeding rates on the soil surface without tillage incorporation must be increased by a minimum of 30%.

Table 1A- SINGLE SPECIES COVER CROP SEEDING RATES AND LATEST SEEDING DATES FOR THE PRIMARY PURPOSE OF EROSION CONTROL, ALSO MAY MEET OBJECTIVES FOR SOIL HEALTH, AND PEST MANAGEMENT

Cover Crop Species[7]	Min. Seeding Rate Lbs./acre	Seeding Depth (inches)	Latest Seeding Dates			
			Fall Cover	Winter Cover	Spring Cover	Summer Cover
Ryegrass[2]- annual or perennial	20	0.25-0.5	Aug. 15	Sept. 15	April. 15	May 15
Winter Rye (certified Aroostook)[1]	112	1.0-1.5	Aug. 15	Oct. 5	NA	NA
Winter Rye (common) /Winter Wheat/Winter Triticale	112	1.0-1.5	Aug. 15	Oct. 1	NA	NA
Oats[5]/Barley[6]/Spring Small Grain	85	1.0-1.5	Aug. 15	Sept. 15	April15	June 1
Sorghum-Sudangrass Hybrids[2,5]	50	1.0-1.5	Aug. 15	Aug. 15	NA	July 1
Millet [5]	30	0.5-1.0	Aug.1	Aug. 1	June 1	July 1
Buckwheat [5]	50	0.5-1.5	July 15	NA	NA	June 1
Radish[2,5]	8	0.25-0.5	Aug. 15	Sept. 1	April 15	May 15
Forage Brassicas /Spring Canola/Turnip/Rapeseed[6]	8	0.25-0.5	Aug. 15	Sept. 1	April 15	May 15
Winter Canola[6]	8	0.25-0.5	Aug. 15	Sept. 15	April 15	May 15
Mustards[2,5]	10	0.25-0.5	Aug. 15	Aug. 15	April 15	May 15

TABLE 1B: COMMON COVER CROP MIX SEEDING RATES AND LATEST SEEDING DATES FOR THE PRIMARY PURPOSE OF EROSION CONTROL, ALSO MAY MEET OBJECTIVES FOR SOIL HEALTH, AND PEST MANAGEMENT						
Cover Crop Mix Species Components[7]	**Min. Seeding Rate Lbs./acre**	**Seeding Depth (inches)**	**Latest Seeding Dates**			
			Fall Cover	**Winter Cover**	**Spring Cover**	**Summer Cover**
1- 1. Ryegrass (annual or perennial) plus Radish						
Ryegrass[2]- annual or perennial	15	.25-0.5	Aug. 15	Sept. 1	April 15	May 15
Radish/Canola/Turnip/ Rapeseed[2]	2					
1-2. Winter Small Grains plus Radish/ Canola/Turnip/Rapeseed						
Winter Small Grain	85	0.5	Aug. 15	Sept. 15	NA	NA
Radish/Canola/ Turnip/Rapeseed	2					
1-3. Spring Small Grain plus Radish or Canola/Turnip/Rapeseed						
Spring Small Grain	85	0.5	Aug. 15	Sept. 1	April 15	May 15
Radish or Canola/Turnip/Rapeseed	2					
1-4. Mustard plus Spring Small Grain						
Mustard	5	0.75	Aug. 15	Aug. 15	April 15	May 15
Spring Small Grain	85					
1-5. Sorghum-Sudangrass Hybrids plus Crimson Clover plus Oats plus Radish plus Spring Canola/Turnip/Rapeseed						
Sorghum-Sudangrass Hybrids	15	0.5	Aug.15	Aug. 15	NA	July 1
Crimson Clover	15					
Oats	32					
Radish	2					
Spring Canola/Turnip/Rapeseed	1					

Table 2A: SINGLE SPECIES COVER CROP SEEDING RATES AND LATEST SEEDING DATES FOR THE PRIMARY PURPOSE OF NITROGEN FIXATION, ALSO MAY MEET OBJECTIVES FOR EROSION CONTROL, SOIL HEALTH AND PEST MANAGEMENT						
Cover Crop Species	**Min. Seeding Rate Lbs./acre**	**Seeding Depth (inches)**	**Latest Seeding Dates**			
			Fall Cover	**Winter Cover**	**Spring Cover**	**Summer Cover**
Alfalfa[2]	15	0.25-0.5	Aug. 15	Aug. 15	April 15	May 1
Clovers[2]-,Alsike, Ladino, Red	10	0.25-0.5	Aug. 15	Aug. 15	April 15	May 15
Clovers[2]-,Yellow Sweet[6], Crimson[6]	20	0.25-0.5	Aug. 15	Aug. 15	April 15	May 15
Austrian Winter Pea/Canadian Field Peas[6]	80	.25-2	Aug. 15	Sept.1	April 15	April 15
Cow Pea[3,5]	80	0.25-2	July 1	NA	NA	June 15
Hairy Vetch	30	1.0-1.5	Aug. 15	Sept. 15	April 15	April 15
Sun Hemp[3,5]	50	1.0-1.5	July 1	NA	NA	June 15
Soybeans[5]	80	0.5-1.0	July 1	NA	NA	June 15

TABLE 2B: COMMON COVER CROP MIX SEEDING RATES AND LATEST SEEDING DATES FOR THE PRIMARY PURPOSE OF SOIL HEALTH. ALSO MAY MEET OBJECTIVES FOR EROSION CONTROL, NITROGEN FIXATION[7], AND PEST MANAGEMENT						
Cover Crop Mix Species Components[7]	**Min. Seeding Rate Lbs./acre**	**Seeding Depth (inches)**	**Latest Seeding Dates**			
			Fall Cover	**Winter Cover**	**Spring Cover**	**Summer Cover**
2-1 Alfalfa Plus Winter Small Grain						
Alfalfa	8	0.5	Aug. 15	Sept. 1	NA	NA
Winter Small Grain	85					
2-2 Alfalfa Plus Spring Small Grain						
Alfalfa	8	0.5	Aug. 15	Aug. 15	April 15	May 1
Spring Small Grain	85					
2-3 Austrian Winter Pea plus Winter Small Grain						
Austrian Winter Pea	50	1.0	Aug. 15	Sept. 1	NA	NA
Winter Small Grain	60					
2-4 Canadian Field Peas plus Spring Small Grain						
Canadian Field Peas	50	1.0	Aug. 15	Aug. 15	April 15	May 1
Spring Small Grain	70					
2-5 Clovers plus Winter Small Grain						
Red, Alsike, Ladino, Clover	8	0.5	Aug. 15	Sept. 1	April 1[4]	April 1[4]
Winter Small Grain	85					
2-6 Clovers plus Spring Small Grain						
Red, Alsike, Ladino, Clover	10	0.5	Aug. 15	Aug. 15	April 15	May 1
Spring Small Grain	64					

TABLE 2B: (CONTINUED) COMMON COVER CROP MIX SEEDING RATES AND LATEST SEEDING DATES FOR THE PRIMARY PURPOSE OF SOIL HEALTH. ALSO MAY MEET OBJECTIVES FOR EROSION CONTROL, NITROGEN FIXATION[7], AND PEST MANAGEMENT						
Cover Crop Mix Species Components[7]	**Min. Seeding Rate Lbs./acre**	**Seeding Depth (inches)**	**Latest Seeding Dates**			
			Fall Cover	**Winter Cover**	**Spring Cover**	**Summer Cover**
2-7 Red Clover plus Ryegrass (annual or perennial)						
Red Clover	10	0.25-0.5	Aug. 15	Sept. 1	April 15	May 1
Ryegrass-annual or perennial	10					
2-8 Red Clover plus Radish/Canola/Turnip/Rapeseed						
Red Clover	10	0.25-0.5	Aug.15	Sept. 1	April 15	May 1
Radish/Canola/Turnip/ Rapeseed	2					
2-9 Hairy Vetch plus Winter Small Grains						
Hairy Vetch	30	1.0-1.5	Aug. 15	Sept.15	NA	NA
Winter Small Grain	50					
2-10 Hairy Vetch plus Spring Small Grains						
Hairy Vetch	30	1.0-1.5	Aug. 15	Sept. 1	April 15	May 1
Spring Small Grain	50					
2-11 Red Clover plus Winter Small Grain plus Radish/Canola/Turnip/Rapeseed						
Red Clover	10	0.5	Aug. 15	Sept 1	NA	NA
Winter Small Grain	60					
Radish/Canola/Turnip/ Rapeseed	2					
2-12 Sorghum-Sudangrass Hybrids plus Sun Hemp						
Sorghum-Sudangrass Hybrids	10	1.0	July 1	July 1	NA	June 15
Sun Hemp	30					

TABLE 2B: (CONTINUED) COMMON COVER CROP MIX SEEDING RATES AND LATEST SEEDING DATES FOR THE PRIMARY PURPOSE OF SOIL HEALTH. ALSO MAY MEET OBJECTIVES FOR EROSION CONTROL, NITROGEN FIXATION, AND PEST MANAGEMENT						
Cover Crop Mix Species Components[7]	**Min. Seeding Rate Lbs./acre**	**Seeding Depth (inches)**	**Latest Seeding Dates**			
			Fall Cover	**Winter Cover**	**Spring Cover**	**Summer Cover**
2-13 Red Clover Plus Ryegrass Plus Radish/Canola/Turnip/Rapeseed						
Red Clover	12	.25-0.5	Aug. 15	Sept. 1	April 15	May 1
Annual or Perennial Ryegrass	10					
Radish/Canola/Turnip/ Rapeseed	2					
2-14 Winter Small Grain plus Austrian Winter Pea plus Red Clover plus Radish plus Winter Canola						
Winter Wheat	40	0.5	Aug. 15	Sept.1	NA	NA
Austrian Winter Pea or Hairy Vetch	20					
Red Clover	6					
Radish	2					
Winter Canola	1					
2- 15. Sorghum-Sudangrass Hybrids plus Crimson Clover plus Oats plus Radish plus Spring Canola/Turnip/Rapeseed						
Sorghum-Sudangrass Hybrids	10	0.5	Aug.15	Aug. 15	NA	June 15
Crimson Clover	15					
Oats	32					
Radish	2					
Spring Canola/Turnip/Rapeseed	1					

TABLE 2B: (CONTINUED) COMMON COVER CROP MIX SEEDING RATES AND LATEST SEEDING DATES FOR THE PRIMARY PURPOSE OF SOIL HEALTH. ALSO MAY MEET OBJECTIVES FOR EROSION CONTROL, NITROGEN FIXATION[7], AND PEST MANAGEMENT						
Cover Crop Mix Species Components[7]	**Min. Seeding Rate Lbs./acre**	**Seeding Depth (inches)**	**Latest Seeding Dates**			
			Fall Cover	**Winter Cover**	**Spring Cover**	**Summer Cover**
2-16 Cover Crop "Cocktail" Mix						
Soybeans	10	0.5	July 15	July 15	NA	June 1
Cowpeas	10					
Yellow Sweet Clover	10					
Red Clover	4					
Sorghum-Sudangrass Hybrids	5					
Pearl Millet	5					
Italian Ryegrass	3					
Forage Radish	2					
Chickory	1					
Winter Canola	2					

TABLE 2B: (CONTINUED)- COMMON COVER CROP MIX SEEDING RATES AND LATEST SEEDING DATES FOR THE PRIMARY PURPOSE OF SOIL HEALTH. ALSO MAY MEET OBJECTIVES FOR EROSION CONTROL, NITROGEN FIXATION[7], AND PEST MANAGEMENT						
Cover Crop Mix Species Components[7]	**Min. Seeding Rate Lbs/acre**	**Seeding Depth (inches)**	**Latest Seeding Dates**			
			Fall Cover	**Winter Cover**	**Spring Cover**	**Summer Cover**
2-17 Cover Crop "Cocktail" Mix						
Soybeans	10	0.5	July 15	July 15	NA	June 1
Cowpeas	10					
Crimson Clover	10					
Berseem Clover	4					
Sorghum-Sudangrass Hybrids	5					
Pearl Millet	5					
Forage Radish	2					
Rape Seed (Dwarf Essex or Bonar) or Pasja Turnip	4					

TABLE 3A: SINGLE SPECIES COMMON COVER CROP SEEDING RATES AND LATEST SEEDING DATES FOR THE PRIMARY PURPOSE OF NITROGEN SCAVENGING TO PREVENT NITROGEN LOSS THROUGH LEACHING-MAY ALSO MEET OBJECTIVES FOR EROSION CONTROL, SOIL HEALTH AND PEST MANAGEMENT						
Cover Crop Species[7]	**Min. Seeding Rate Lbs/acre**	**Seeding Depth (inches)**	**Latest Seeding Dates**			
			Fall Cover	**Winter Cover**	**Spring Cover**	**Summer Cover**
Ryegrass- Perennial or Annual[2]	20	0.25-0.5	Sept. 1	Sept. 1	April 15	May 1
Rye Winter Annual Aroostook[1] (Certified)	112	1.0-1.5	Oct. 5	Oct. 5	NA	NA
Rye Winter Annual-Common	112	1.0-1.5	Oct. 1	Oct. 1	NA	NA
Wheat, Winter Annual	112	1.0-1.5	Oct. 1	Oct. 1	NA	NA
Triticale, Winter Annual	112	1.0-1.5	Oct. 1	Oct. 1	NA	NA
Oats/Spring Small Grain[5]	96	1.0-1.5	NA	NA	April 15	May 1
Sorghum-Sudangrass Hybrids[2,5]	50	1.0-1.5	NA	NA	June 1	June 15
Millet[5]	30	0.5-1.0	NA	NA	June 1	June 1
Buckwheat[5]	50	0.5-1.5	NA	NA	June 1	July 15
Radish[2,5]	8	0.25-0.5	NA	NA	April 15	May 1
Winter Canola[6]	8	0.25-0.5	Sept. 1	Sept. 1	April 15	May 1
Mustards[2,5]	10	0.25-0.5	NA	NA	April 15	May 15

TABLE 3B: COMMON COVER CROP MIX SEEDING RATES AND LATEST SEEDING DATES FOR THE PRIMARY PURPOSE OF NITROGEN SCAVENGING TO PREVENT NITROGEN LOSS THROUGH LEACHING- MAY ALSO MEET OBJECTIVES FOR, EROSION CONTROL, SOIL HEALTH AND PEST MANAGEMENT						
Cover Crop Mix Species Components[7]	**Min. Seeding Rate Lbs/acre**	**Seeding Depth (inches)**	**Latest Seeding Dates**			
			Fall Cover	**Winter Cover**	**Spring Cover**	**Summer Cover**
3-1 Ryegrass (annual or perennial) plus Radish/Canola/Turnip/Rapeseed						
Ryegrass-Perennial or Annual	15	0.25-0.5	Aug. 15	Sept 1	April 15	May 1
Radish/Canola/Turnip/ Rapeseed	2					
3-2 Ryegrass (annual or perennial) plus Winter Small Grain						
Ryegrass-Perennial or Annual	15	0.5	Sept. 1	Sept 15	NA	NA
Winter Small Grain	50					
3-3 Ryegrass (annual or perennial) plus Spring Small Grain						
Ryegrass- Perennial or Annual	15	0.5	Aug. 15	Aug 15	April 15	May 1
Spring Small Grain	50					
3-4 Winter Small Grains plus Radish/Canola/Turnip/Rapeseed						
Winter Small Grain	85	0.5	Sept. 1	Sept 15	NA	NA
Radish/Canola/Turnip/ Rapeseed	2					
3-5 Spring Small Grain plus Radish/Canola/Turnip/Rapeseed						
Spring Small Grain	85	0.5	NA	NA	April 15	May 1
Radish/Canola/Turnip/ Rapeseed	2					

Table Footnotes:

[1] NRCS-NY recommends the use of Aroostook Rye over Common Rye Variety Not Stated (VNS).

[2] Considered deep rooted and will benefit compacted soil conditions.

[3] Don't plant before the soil temperature reaches 55 Degrees F or June1st.

[4] Frost seed clover into winter small grain during early spring coinciding with daily freeze-thaw cycles.

[5] Species likely will winter or frost kill in most locations in New York.

[6]May winter kill in colder regions of New York, check variety for winter hardiness.

[7]Non-legume species alone or mixed with legumes have the potential to immobilize Nitrogen (N) at termination and adversely impact the subsequent crop. Additional N (fertilizer, manure or both) may need to be added to the system at Cover Crop termination to reduce the impact of N immobilization. A time frame of up to two weeks may be required between termination and crop planting where N status is limiting to reduce the impact of N immobilization.

7. ADDITIONAL CONDITIONS

(a) Document additional conditions on a site specific NY 340 Cover Crop Job Sheet. Additions and substitutions to this specification must be approved by appropriate technical specialist with Job Approval Authority.