NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

COVER CROP

CODE 340

SPECIFICATIONS DEVELOPMENT TABLES

TABLE 1 – Common Adapted Single Species Cover Crops

*All seeding rate recommendations are for **pure live seed (PLS)**
***Broadcast** ranges increase drilled PLS rates by 15%,
***Aerial seeding** ranges increase drilled PLS rates by 30%.
***Species in RED in Tables 1-3 are pollinator-friendly options if a producer secondary objective in 340 practice implementation OR for information only if considering other practices with a pollinator habitat establishment purpose (ex 327, 420, 512). 340 should not be a primary practice planned for pollinator habitat establishment.**

Cover Crop **GRASSES/ NONLEGUMES** (*Managing Cover Crops Profitably* Cover Crop Species Overview resource page if available)	[2] Typical Seeding Rate Ranges to Address RCs and Achieve Practice Purposes (lbs/ac) (PLS**) (Drilled) **See Key Points Bullet 3 for PLS seeding rate calculation info	[2] Typical Planting Date Ranges by NC Region to Address Identified Resource Concern(s) and Achieve Associated 340 Practice Purpose(s)		
		Coastal Plain (Approximate)	Piedmont (Approximate)	Mountains (Approximate)
Annual Ryegrass (MCPP pg. 74)	15-25	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
Barley (MCPP pg. 77)	50-70	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
Little Barley	30-40	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
[1] *Millet (Pearl)*	*12-20*	May 1 – June 15	May 1 – July 1	May 15 – July 1
[1] *Millet (Proso)*	*15-25*	May 1 - June 15	May 1 – July 1	May 15 – July 1
Oats (common) (MCPP pg. 93)	60-80	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25 – Oct 15
Cereal Rye (MCPP pp.98)	60-80	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
[1]*Sorghum-Sudan (Sudex)* *(MCPP pg. 106)*	*20-30*	May 1 - June 15	May 1 – July 1	May 15 – July 1
Triticale	60-80	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
Wheat (MCPP pg. 111)	60-80	Sept 1 - Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
[1]*Buckwheat (MCPP pg. 90)*	*45-55*	May 1 – July 1	May 15 - July 15	June 1 – July 15
Radish (forage, oilseed, Daikon) (MCPP pg. 81)	5-10	Aug 15 – Nov 1	Aug 1 – Oct 15	Aug 1 – Oct 1
Mustards (MCPP pg. 81)	5-10	Aug 15 – Nov 1	Aug 1 – Oct 15	Aug 1 – Oct 1
Phacelia	7-10	Aug 15 – Nov 1	Aug 1 – Oct 15	Aug 1 – Oct 1
Canola	4-5	Feb15-Mar15 Sept 1 – Nov 1	Feb 15 – Apr 1 Aug 1 – Oct 15	Mar 1 – Apr 30 Jul 15 – Oct 1
[1]*Sunflower*	*8-12*	May 1 – July 1	May 15 - Jul 15	June 1 – Aug 1
[1]*Sunn Hemp*	*12-20*	May 1 – July 1	May 15 - Jul 15	June 1 – Aug 1
Turnip (MCPP pg. 81)	5-10	Feb15 –Mar15 Sept 1 – Oct 30	Feb 15 – Apr 1 Aug 1 – Oct 15	Mar 1 – May 15 Jul 15 – Oct 1
Black Oats	50-70	Sept 1 – Nov 15	Aug 25 – Nov 1	July 25 – Oct 15

Cover Crop	[2]Typical Seeding Rate Ranges to Address RCs and Achieve Practice Purposes (lbs/ac)	[2] Typical Planting Date Ranges by NC Region to Address Identified Resource Concern(s) and Achieve Associated 340 Practice Purpose(s)		
LEGUMES (*Managing Cover Crops Profitably* Cover Crop Species Overview resource page if available)	(PLS**) (Drill) **See Key Points bullet 3 for PLS seeding rate calculation info	**Coastal Plain (Approximate)**	**Piedmont (Approximate)**	**Mountains (Approximate)**
Arrowleaf Clover	4-10	Sept 1 – Nov 1	Aug 25 – Oct 15	Jul 25-Oct 1
Austrian Winter Pea	30-40	Sept 1 – Nov 1	Aug 25 – Oct 15	Jul 25-Oct 1
[1]*Cowpea (MCPP pg. 125)*	*25-35*	May 1 – July 1	May 15 - Jul 15	June 1 – Aug 1
Crimson Clover (MCPP pg. 130)	12-20	Sept 1 – Nov 1	Aug 25 – Oct 15	Jul 25-Oct 1
Hairy Vetch (MCPP pg. 142)	12-20	Sept 1 – Nov 1	Aug 25 – Oct 15	Jul 25-Oct 1
[1]*Soybeans*	*40-60*	May 1 – July 1	May 15 - Jul 15	June 1 – Aug 1

[1] ***Summer/Warm Season Cover Crop***

[2] ***See Key Points explanation (first bullet) at conclusion of Specifications Development Tables for seeding rate and date variability justification and documentation requirements.***

TABLE 2 – Common Adapted Winter Cover Crop Mixes for NC

*All seeding rate recommendations are for **pure live seed (PLS).**
Broadcast ranges increase drilled rates by 15%,
Aerial seeding ranges increase drilled rates by 30%.

Cover Crop Winter Cover Crop Mixes	[2]Typical Seeding Rate Ranges to Address RCs and Achieve Practice Purposes (lbs/ac) (PLS**) (Drilled) **Key Points bullet 3	[2] Typical Planting Date Ranges by NC Region to Address Identified Resource Concern(s) and Achieve Associated 340 Practice Purpose(s)		
		Coastal Plain (Approximate)	Piedmont (Approximate)	Mountains (Approximate)
Cereal Rye Daikon Radish	45-55 3-4	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
Cereal Rye Crimson Clover	40-50 10-15	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
Cereal Rye Crimson Clover Daikon Radish	30-35 8-10 1.5-2	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
Austrian Winter Pea Crimson Clover Hairy Vetch	20-25 8-10 12-15	Sept 1 – Nov 1	Aug 25 – Oct 15	Jul 25-Oct 1
Cereal Rye Austrian Winter Pea Crimson Clover Daikon Radish	30-35 20-25 8-10 1.5-2	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
Cereal Rye Crimson Clover Hairy Vetch Daikon Radish	30-35 8-10 8-10 1.5-2	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
Cereal Rye Austrian Winter Pea Crimson Clover Hairy Vetch	35-40 25-30 8-10 8-10	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
Cereal Rye Triticale Oats Crimson Clover Daikon Radish	25-30 12-15 8-10 8-10 1.5-2	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
Triticale Austrian Winter Pea Hairy Vetch Canola Purple Top Turnip Phacelia	50-60 25-30 12-15 3-5 3-5 3-5	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15
Cereal Rye Annual Ryegrass Austrian Winter Pea Crimson Clover Hairy Vetch Radish Turnip	12-15 2-3 8-10 1.5-2 2-3 1 1	Sept 1 – Nov 15	Aug 25 – Nov 1	Jul 25-Oct 15

[2] *See Key Points explanation (first bullet) at conclusion of Specifications Development Tables for seeding rate and date variability justification and documentation requirements.*

TABLE 3 – Common Adapted Summer Cover Crop Mixes for NC

*All seeding rate recommendations are for **pure live seed (PLS).**
Broadcast ranges increase drilled rates by 15%,
Aerial seeding ranges increase drilled rates by 30%.

Cover Crop **Summer Cover Crop Mixes**	[2]Typical Seeding Rate Ranges to Address RCs and Achieve Practice Purposes (lbs/ac) (PLS**) (Drilled) **See Key Points bullet 3	[2] Typical Planting Date Ranges by NC Region to Address Identified Resource Concern(s) and Achieve Associated 340 Practice Purpose(s)		
		Coastal Plain (Approximate)	**Piedmont (Approximate)**	**Mountains (Approximate)**
Cowpea Soybeans	30-35 30-35	*May 1 – July 1*	*May 15 - Jul 15*	*June 1 – Aug 1*
Sorghum-Sudan Buckwheat Cowpea	20-25 12-15 28-35	*May 1 – July 1*	*May 1 – July 15*	*May 15 – July 15*
Pearl Millet Buckwheat Cowpea	12-15 12-15 28-35	*May 1 – July 1*	*May 1 – July 15*	*May 15 – July 15*
Pearl Millet Proso Millet Sorghum-Sudan Soybean Cowpea Sunflower Radish	1 1.5-2 3-4 12-15 15-20 1 1	*May 1 – July 1*	*May 15 - Jul 15*	*June 1 – Aug 1*
Oats *Austrian Winter Pea* *Cowpea* *Pearl Millet* *Sunn Hemp* *Radish*	*8-10* *4-5* *2-3* *2-3* *1.5-2* *1*	*May 1 – July 1*	*May 15 - Jul 15*	*June 1 – Aug 1*

[2] *See Key Points explanation (first bullet) at conclusion of Specifications Development Tables for seeding rate and date variability justification and documentation requirements.*

KEY POINTS FOR USING CPS 340 SPECIFICATIONS DEVELOPMENT TABLES:

- Specifications variabilities from cover crop seeding rates, dates, and varieties included in these tables should be supported by locally relevant research/resource information from or collaboration with qualified agronomy professional resources like NC CES, University, NCDA and/or documented local stand successes with alternative seeding rates/dates. The planner is responsible for retaining sufficient case file documentation/information to support all aspects of the seeding specification provided to the producer -- including local/regional adaptability of cover crop type, seeding rates and dates.

- Seeding rates included in producer Specifications should always be developed with primary purpose of addressing resource concerns and achieving practice purposes on the planning site in mind. Potential producer financial assistance returns from 'low' seeding rates should not be a consideration in specification development.

- **Use of Certified OR "Bin Run"/Farmer Saved Seed + Calculations of per acre bulk seed to achieve PLS rates in 340 Implementation Requirements (IR) Establishment Specifications** -- Although Certified Seed is preferred for cover crop establishment, "bin run"/farmer saved seed may be used when purity and germination tests are performed (see "Considerations" section of this 340 CPS) and results utilized for calculations of per acre bulk seeding quantities necessary to meet Pure Live Seed(PLS) seeding rate recommendations from 340 Specifications Development Tables. **Whether using certified seed or "bin run" seed, per acre bulk seed quantities for recommended cover crop species must be sufficient to achieve lbs/ac PLS seeding rate range provided in Specifications Development Tables or locally supported rate range variations (see Bullet 1).** See %PLS/PLS Seeding Rate calculations steps and example below, also included in 340 Implementation Requirements (IR).

  % PLS/PLS Seeding Rate Calculations Steps: (1) % PLS = % Purity x % Germination; (2) Total bulk seed needed per acre = PLS Seeding Rate recommendation divided by % PLS.

  Example – (1) 95% purity x 60% germination (from Certified Seed bag tag or test results) = 57 % PLS; (2) Total seed needed per acre (cereal rye example – 70 lbs PLS from 340 Specifications Table) = 70 divided by .57 = 123 lbs bulk seed/acre needed based on certified seed bag tag or bin run seed purity and germination test results.

- **BIOMASS PRODUCTION/PURPOSE NOTE**: When high biomass levels present at cover crop termination are necessary to address resource concerns and achieve practice purposes, such as maintain or increase soil health and organic matter content, or suppression of excessive weed pressures, specifications for cover crop establishment and management must reflect consideration, within crop system pre-cover crop harvest dates and post-cover crop production planting dates, of seeding dates, sufficiently full seeding rates, and 'late' termination dates necessary to achieve maximum biomass levels possible. Within the planning process, consider other Cover Crop practice purposes when production crop system planting and/or harvest dates and or desired seeding rates/dates may not allow agronomic growth period to effectively achieve biomass quantity related purposes and address associated resource concerns. (See 340 CPS Appendix A -- MCPP Chart 2 "Performance and Roles")

- Development of specifications -- including establishment timing and methods, single species vs multi species mix, and termination dates -- should be based on the purpose of the cover crop, crop rotation (harvest and planting dates of cash crops), local climate and soils conditions, and knowledge of producer experience and expertise in cover crop management.

- Planting outside of the provided seeding date ranges can produce a stand that will achieve practice purpose(s), but is not recommended unless supported and documented per key point bullet 1 and may require a substantial increase in seeding rates to achieve the intended purpose of the practice.

- Other species, including native annuals, not included in these tables may be used if the cover provided will be adequate to meet the intended purpose of the practice.

- When cover crops are intended for use as a grazing forage, higher seeding rates may be necessary to achieve projected quantities of forage produced per grazing management plan and the intended purpose of the 340 practice. If utilized as a management method, grazing cover crops must be implemented in a manner that does not prevent achieving the intended 340 practice purpose.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

NRCS, NC
May 2021