

Practice Specification Cover Crop Soil Health (Code 340)

1. Scope

The work shall consist of furnishing all materials and performing cultural operations necessary to grow and maintain the cover crop to protect soil, improve soil conditions, conserve moisture, add biomass to the soil, improve infiltration and tilth, reduce compaction, manage pests and nutrients, and/or provide supplemental forage.

2. Materials

Seed. Seed used in this specification will meet the requirements as stated in Kansas Noxious Weed Law (Kansas Statutes Annotated [K.S.A. 2-1314] and the Kansas Agriculture Seed Law [K.S.A. 2-1415]).

When seed is purchased, the seed tags will be evidence of the purity and germination of the seed. Time since date of seed test shall not exceed nine (9) months from the date the seed is planted.

Seed shall be of a quality that weed seed shall not exceed 0.5% of the seed and other material.

Seed raised on farm will meet all requirements in this section.

Fertilizer. All fertilizer shall be labeled in accordance with applicable state regulations and bear the warranty of the producer for the grade furnished.

Inoculants. The inoculants for treating legume seed shall be a pure culture of Nitrogen fixing bacteria prepared specifically for the plant species, and shall not be used later than the date indicated on the container. A mixing medium, as recommended by the manufacturer or approved substitute, shall be used to bond the inoculant to the seed. For non-sandy soils with a pH greater than 6.0 and that have previously grown well-nodulated crops of the same species within the last five (5) years, inoculation is usually not necessary. When planting legumes in sandy soil, inoculant treatment shall be applied if the species has not been grown within the last three (3) years.

Chemicals. All pesticides used in performing this practice shall be federally, State, and locally registered and shall be applied strictly in accordance with authorized and registered uses, directions on the label, and other federal or State policies and requirements. Chemical containers shall be properly stored and disposed of in a safe manner.

3. Seeding Mixture and Planting Date

The seed(s) and rate(s) specified on Form KS-ECS-6, Cover Crop Design, shall be used.

The seeding rate(s) shall be the weight exclusive of any coating material. Any legume seed used shall be inoculated.

Multi-species cover crop mixes should include adequate species diversity to compliment cash crops grown in rotation and to meet the purpose of the cover (e.g., erosion, organic matter, compaction, forage). No fewer than three (3) species should be included in a mix.

For the purpose of increasing soil organic matter, cover crop mixes will contain five (5) species or more, of which one (1) is a legume and the mix will have a Carbon to Nitrogen ratio greater than 30. The goal of the cover crop is to provide 80 – 100 percent ground cover.

Cover crop mixes should be planned to contain a minimum of 650,000 seeds per acre in Zone 3; 450,000 seed per acre in Zone 2; and 325,000 seed per acre in Zone 1. Mixes shall be composed of species that meet the primary resource concern. Species will have an excellent or very good rating on Table 1 of Form KS-ECS-6, Cover Crop Design. The zones may be found in the map titled, Kansas Cover Crop Seeding Rate Zones. Information on cover crop species and characteristics can be found using the Midwest Cover Crop Council – Cover Crop Decision Tool.

Rye may be used, but be aware of the potential allelopathic effects. It is recommended that the rye be completely dead prior to planting subsequent crops. While allelopathic effects may be beneficial for weed control, they may also inhibit establishment and growth of the subsequent crop. It is recommended that

the rye be terminated 14 days before seeding the cash crop. Follow current Natural Resources Conservation Service (NRCS) Cover Crop Termination Guidelines for cover crop termination dates.

Specific cover crop species not contained within species tables may be utilized, as long as the species is within the desired family (legume, brassica, grass) and is not considered locally invasive or invasive as per Kansas Noxious Weed Law. The species will compose no more than 20 percent of the mix. Species with an N/O rating in a factor of the Cover Crop Table—Performance and Roles will compose no more than 20 percent of the mix, if it is being used to address that factor. Species will be documented on Form KS-ECS-6, Cover Crop Design.

When using rye, barley, and other wheat related plants, review Kansas State Research and Extension publication MF2866 “Hessian Fly” for management considerations.

The use of buckwheat must be excluded from cover crop plantings in rotation or adjacent to fields with wheat production and must abstain from growing wheat when used as a commodity crop for two (2) calendar years after planting buckwheat. “Adjacent” is defined as within 30 feet of a wheat field. The use of buckwheat must be excluded from pollinator plantings in rotation with or adjacent to commodity wheat within the next two (2) calendar years. The use of buckwheat in conservation plantings is still permitted in fields or areas that are not used for commodity wheat production.

Planting shall be performed during the period that is specified on Form KS-ECS-6, Cover Crop Design.

4. Seedbed Preparation

The area to be planted shall be weed-free and have a seedbed prepared as specified on Form KS-ECS-6, Cover Crop Design.

Seedbed preparation shall be suspended when soil moisture conditions are not suitable for obtaining a satisfactory seedbed.

When seeding multiple species mixes with different seeding depths, set drill to the average depth for all species.

When planting legumes requiring inoculation in soils with a pH lower than 6.0, amend the soil pH by liming according to soil test recommendations, prior to planting the legume. If the soil pH is less than 6.0, a soil test will be required.

Review producer’s herbicide program and ensure the species selected are compatible with past herbicide use.

5. Fertilizing and Seeding

Fertilizing. Fertilizer shall be distributed uniformly over the seedbed and applied according to a soil test within the criteria of Kansas Conservation Practice Standard 590, Nutrient Management, and as specified on Form KS-ECS-6, Cover Crop Design.

Fertilizer shall be applied in any way that will result in uniform distribution. The fertilizer shall be incorporated into the soil. Incorporation may be as part of the seedbed preparation or as part of the seeding operation, unless otherwise specified on Form KS-ECS-4, Grass Seeding, and/or Form KS-ECS-6, Cover Crop Design.

Seeding. Seed shall be drilled or broadcast by hand, mechanical hand seeder, or power operated seeder.

Aerial seeding will be allowed into standing crops. Consult the aerial seeding of cover crops supplement for seeding considerations.

When seeding by air into standing crop residue or growing row crops, or during the last field operation, increase seeding rate 1.5 times.

Where wind erosion is a consideration, cover crops planted in rows greater than 20 inches will be planted perpendicular to the prevailing wind during the critical wind erosion management period.

Seeding shall be performed as nearly as practical across the slope unless otherwise specified on Form KSECS-6, Cover Crop Design.

6. Irrigation

When specified, irrigation water shall be applied during the establishment period at the times and rates listed on Form KS-ECS-6, Cover Crop Design.

7. Additional Cultural Operations

Managing cover crops. a. Removal of biomass by haying, chopping, etc. is prohibited. b. Management of the cover crop will be necessary and should be planned for prior to planting the covers. 1. Natural termination will be when climatic or growing conditions naturally terminate the cover crop. Whenever possible, cover crop plantings will be planned to take advantage of natural termination by way of freezing. Time the plantings to obtain the desired plant height or physiological development prior to the normally occurring killing frost date. 2. Mechanical controls will be mowing, tillage, and rolling. i Mowing should be done prior to seed development, unless cover crop reseeding is a planned purpose. Height may be determined by other practices being implemented in a conservation plan. ii Tillage may not provide complete control without repeating the application and may need to be used in a combination with other controls. Consideration should be given to timing and effects of tillage on moisture conservation and the rest of the crop rotation. iii Rolling will be conducted in a way that will terminate the vascular transport functions of the cover crop. Rollers will be outfitted with horizontal knives or angle irons that are no more than 12 inches apart on the circumference of the roller. Knives or angle irons should not be sharp enough to chop the cover crop, the intended design is to lie over and crimp the plant stalks.

8. Other Requirements

Other details for the establishment and maintenance of the plants including, but not limited to, the need for livestock and traffic control shall be applied as specified on Form KS-ECS-6, Cover Crop Design.

The owner, operator, contractor, or other persons shall conduct all work and operations in accordance with proper safety codes for the type of equipment and operations being performed with due regards to safety of all persons and property.

Seeding specifications will be documented with Form KS-ECS-6, Cover Crop Design.

Cover Crop Table—Performance and Roles

Cover Crop Table—Performance and Roles

Species	Crop Type ¹	Winter Hardiness ²	Total N (lbs/A) ³	Dry Matter (lbs/A/yr)	N Scavenger ⁴	Soil Builder ⁴	Erosion Fighter ⁴	Weed Fighter ⁴	Good Graze ⁴	Break Compact Layers ⁴
NON-LEGUMES										
Annual Ryegrass	CG	Statewide		200-4,000	VG	VG	E	E	VG	VG 6
Spring Barley	CG	Statewide		200-4,000	VG	VG	G	VG	E	VG 1
Winter Barley	CG	Statewide		200-4000	VG	E	E	VG	E	VG 6
Spring Oats	CG	NFT		200-3,000	VG	VG	VG	VG	E	G
Winter Oats	CG	Zone 6B		200-3,000	VG	VG	VG	VG	E	G
Flax	CG	Statewide		200-1000	G	F	F	P	F	G
Cereal Rye	CG	Statewide		200-6,000	E	E	E	E	E	E 6
Winter Wheat	CG	Statewide		200-5,000	VG	E	E	E	E	E 6
Spring Triticale	CG	Statewide		200-5,000	VG	E	E	E	E	E 6
Winter Triticale	CG	Statewide		200-5,000	VG	E	E	E	E	E 6
Corn	WG	NFT		3,000-12,000	E	VG	VG	VG	E	G
Forage Sorghum	WG	NFT		1,000-12,000	E	E	E	E	VG	E 6
Sorghum-Sudangrass	WG	NFT		1,000-12,000	E	E	E	E	E	E 6
German Millet	WS	NFT		500-8,000	G	VG	VG	VG	VG	G
Pearl Millet	WG	NFT		1,000-10,000	VG	E	E	E	E	E 6
Proso Millet	WG	NFT		500-4,000	G	VG	VG	VG	VG	G
Safflower	CB	NFT		200-2,500	G	F	F	F	P	E
Sunflower	WB	NFT		200-5,000	VG	F	F	F	F	E
Teff Grass	WG	NFT		200-5,000	G	G	G	G	G	F
Turnip	CB	NFT	5-65	200-2,000	VG	G	G	E	VG	G
Hybrid Forage Turnip	CB	NFT	5-100	200-3,000	E	G	VG	VG	VG	VG
Oilseed Radish	CB	NFT	5-100	200-3,500	E	G	G	G	G	E
Grazer Radish	CB	NFT	5-100	200-5,500	VG	G	G	VG	VG	E
Mustard	CB	NFT	5-65	200-2,000	G	G	G	VG	P	G
Ethiopian Cabbage	CB	NFT	5-75	200-3,000	G	G	G	G	F	F
Rapeseed/Canola	CB	NFT	5-65	200-2,000	VG	G	G	G	VG	G

Cover Crop Table—Performance and Roles, continued.

Species	Crop Type ¹	Winter Hardiness ²	Total N (lbs/A) ³	Dry Matter (lbs/A/yr)	N Scavenger ⁴	Soil Builder ⁴	Erosion Fighter ⁴	Weed Fighter ⁴	Good Graze ⁴	Break Compact Layers ⁴
Kale/Collards	CB	NFT	N/O	N/O	VG	G	G	VG	VG	E
Buckwheat	WB	NFT		500-2,000	F	G	F	G	F	F
Flax	CB	NFT	5-20	200-100	G	F	F	P	F	G
LEGUMES (produces soil nitrogen when properly inoculated)										
Cowpeas	WB	NFT	100-150	2,500-4,500	F	VG	G	G	VG	G
Crimson Clover	WB	Southern KS	100-200	3,500-5,500	F	G	G	G	G	VG
Soybean	WB	NFT	30-70	4,000-8,000	F	VG	G	F	E	G
Sunn Hemp	WB	NFT	60-120	2,000-6,000	F	VG	VG	VG	F	VG
Hairy Vetch	CB	Statewide	90-200	2,300-5,000	F	G	G	G	P	G
Red Clover	CB	Statewide	70-150	2,000-5,000	F	VG	VG	VG	VG	VG
Subterranean Clover	CB	NFT	75-200	3,000-8,500	F	VG	VG	E	VG	P
Sweet Clover	CB	Statewide	90-170	3,000-5,000	F	G	G	G	VG	VG
White Clover	CB	Statewide	80-200	2,000-6,000	F	G	VG	VG	E	F
Woollypod Vetch	CB	NFT	100-250	4,000-8,000	G	G	VG	VG	G	VG
Chickling Vetch	CB	NFT	5-50	200-2,000	F	G	G	F	P	F
Common Vetch	CN	Statewide	5-50	200-2,000	F	G	G	G	P	G
Field Pea	CB	NFT	90-150	4,000-5,000	F	F	G	F	VG	G
Winter Pea	CB	Statewide	5-60	200-2,500	F	F	G	F	VG	G
Alfalfa	CB	Statewide	70-120	4,000-8,000	F	E	G	F	E	VG
Mung Beans	WB	NFT	10-80	500-5,000	F	F	G	F	G	G
Cowpeas	WB	NFT	10-80	500-5,000	F	VG	G	G	VG	G
Guar	WB	NFT	20-120	1,000-7,500	F	F	G	F	F	G
Lentils, Spring	WB	NFT	5-20	200-1,000	F	F	F	F	G	F
Lentils, Winter	WB	All of Kansas	5-20	200-1,000	F	F	F	F	G	F
Fava Bean	CS	NFT	N/O	N/O	G	VG	G	G	G	G

¹ **Crop Type:** **CG**=Cool-Season grass, **WG**=Warm-Season grass, **CB**=Cool-Season Broadleaf, **WB**=Warm-Season Broadleaf

² **Winter Hardiness:** Either adapted to climate statewide, southern Kansas, or not frost tolerant (NFT)

³ **Total N:** Total N benefit from entire plant (Grasses not considered N source)

⁴ **N/O**=Not Observed **P**=Poor **F**=Fair **G**=Good **VG**=Very Good **E**=Excellent

⁵**Habitat:** **C**=Climbing; **U**=Upright; **P**=Prostrate; **SP**=Semi-prostrate; **SU**=Semi-upright

⁶ **Surface Compaction**

Cover Crop Table—Cultural Traits

Species	Quick Growth ⁴	Lasting Residue ⁴	Duration ⁴	Harvest Values ⁴		Cash Crop Interseed ⁴	Comments
				F*	S*		
NON-LEGUMES							
Annual Ryegrass	G	G	VG	VG	F	VG	Heavy N and water use; likes wet soils.
Spring or Winter Barley	VG	E	F	VG	F	VG	Tolerates moderately alkaline conditions, but does poorly in acid soil pH <6.0.
Spring Oats	E	G	F	E	E	VG	Prone to lodging in N-rich soil.
Winter Oats	F	E	VG	G	G	E	
Flax	F	F	P	P	P	P	
Winter Rye	E	E	VG	E	F	VG	Tolerates triazine herbicides; may be allelopathic to corn.
Winter Wheat	E	E	VG	E	E	VG	Heavy N and water user in spring.
Spring or Winter Triticale	VG	VG	VG	F	G	F	
Com	VG	E	VG	VG	VG	P	
Forage Sorghum	E	E	VG	E	P	P	
Sorghum-Sudangrass	E	E	E	E	P	P	Mid-season cutting increases yield and root penetration.
German Millet (Foxtail)	E	VG	F	VG	G	P	Mid-season cutting increases root penetration.
Pearl Millet	VG	VG	F	E	G	P	
Proso Millet	E	VG	F	F	G	P	Heavy seed producer for later competition.
Safflower	VG	VG	F	P	VG	P	
Sunflower	VG	G	F	F	E	P	
Teff	E	G	G	VG	G	P	
Turnip	VG	F	G	P	G	VG	
Hybrid Forage Turnip	E	F	G	P	P	VG	
Oilseed Radish	VG	F	G	P	P	VG	Good N scavenging and weed control; N released rapidly; does not like acid soils.
Grazer Radish	E	F	G	P	P	VG	
Mustard	VG	F	G	P	F	P	
Ethiopian Cabbage	VG	F	G	P	P	P	
Rapeseed/Canola	VG	F	F	P	E	VG	
Kale	N/O	N/O	N/O	N/O	N/O	N/O	
Buckwheat	E	P	F	P	VG	VG	Summer smother crop; breaks down quickly.

Cover Crop Table—Cultural Traits, continued.

Species	Quick Growth ⁴	Lasting Residue ⁴	Duration ⁴	Harvest Values ⁴		Cash Crop Interseed ⁴	Comments
				F*	S*		
NON-LEGUMES							
Flax	F	F	F	P	P	P	
LEGUMES							
Cowpeas	VG	F	VG	G	P	P	Season length, habit varies by cultivar.
Crimson Clover	G	F	F	G	F	VG	Establishes easily, grows quickly if planted early in fall; matures early in spring; avoid wet soils.
Soybean	G	F	G	G	E	VG	
Sunnhemp	F	E	VG	G	P	P	Will not set seed.
Hairy Vetch	G	F	VG	P	F	G	Bi-culture with small grain expands seasonal adaptability.
Red Clover	G	F	G	VG	F	VG	Excellent forage, easily established; widely adapted.
Subterranean Clovers	G	VG	VG	VG	P	E	Strong seedlings, quick to nodulate.
Sweet Clover	F	F	VG	G	F	G	Tall stalks, deep roots in second year.
White Clover	F	F	E	VG	G	VG	Persistent after first year.
Woollypod Vetch	VG	F	VG	F	VG	G	Reseeds poorly if mowed within 2 months of seed drop; overgrazing is harmful.
Chickling Vetch	F	F	F	P	F	P	
Common Vetch	G	F	F	P	F	G	
Field Pea	G	G	G	G	F	F	Needs small grain crop for climbing vines.
Winter Pea	G	F	G	G	F	F	
Alfalfa	F	F	VG	VG	F	E	Perennial cover for longer cover.
Mung Beans	VG	F	VG	F	P	P	
Guar	G	F	VG	F	G	P	
Lentils, Spring	F	F	F	F	P	P	
Lentils, Winter	F	F	F	F	P	P	
Fava Bean	N/O	N/O	N/O	VG	VG	N/O	

Cover Crop Table—Potential Advantages

Species	Tolerances ⁴					Habit ⁵	pH (Pref.)	Establishment Periods	Min. Germ. Temp.(F)
	Heat	Drought	Shade	Flood	Low Fert.				
NON-LEGUMES									
Annual Ryegrass	F	G	VG	VG	G	U	5.8-7.0	Spring/Fall	40
Spring or Winter Barley	VG	VG	G	F	VG	U	6.0-8.5	Fall/Spring	38
Spring Oats	G	G	G	G	VG	U	4.5-7.0	Late summer/Spring	38
Winter Oats	F	F	F	G	G	U	5.0-7.0	Late Summer/Fall	38
Flax	G	G	F	F	F	U	6.0-7	Spring	48
Winter Rye	G	VG	VG	G	E	U	5.0-7.0	Late summer/Fall	34
Winter Wheat	G	G	G	P	G	U	6.0-7.5	Late summer/Fall	38
Spring or Winter Triticale	G	G	G	F	G	U	5.0-7.0	Spring/Fall	38
Corn	VG	F	P	P	F	U	5.6-7.5	Late Spring	55
Forage Sorghum	E	E	P	G	G	U	5.5-7.0	Summer	65
Sorghum-Sudangrass	E	E	P	G	G	U	5.5-7.0	Summer	65
German Millet	E	E	P	F	VG	U	5.5-7	Summer	65
Pearl Millet	VG	F	F	P	G	U	5.0-7.0	Summer	65
Proso Millet	E	E	P	F	VG	U	5.5-7.0	Summer	65
Safflower	G	F	P	P	G	U	6.0-7.0	Spring/Summer	45
Sunflower	E	E	F	F	G	U	6.0-7.0	Summer	65
Teff	E	E	P	VG	G	U	4.5-8.0	Summer	65
Turnip	G	G	F	F	F	U	5.3-6	Spring/Summer	45
Hybrid Forage Turnip	G	G	F	F	F	U	5.3-6.0	Spring/Summer	45
Oilseed Radish	G	F	G	F	F	U	6.0-7.5	Spring/Summer	45
Grazer Radish	G	G	F	F	F	U	6.0-7.0	Spring/Summer	40
Mustard	G	VG	G	F	F	U	5.5-7.5	Spring/Summer	40
Ethiopian Cabbage	G	G	F	F	F	U	6.0-6.8	Spring/Summer	45
Rapeseed/Canola	G	G	F	F	F	U	5.5-8.0	Spring/Fall	41
Buckwheat	G	P	F	F	F	U/SU	5.0-7.0	Spring/Summer	50
Flax	G	G	F	F	F	U	6.0-7.0	Spring/Summer	48
LEGUMES									
Cowpeas	E	VG	G	F	E	SU/C	5.5-6.5	Summer	58
Crimson Clover	G	G	G	F	G	U/SU	5.5-7.0	Summer	42
Soybean	VG	VG		G	F	U	5.8-7.0	Summer	50
Sunnhemp	E	VG	F	F	VG	U	5.0-7.0	Summer	68

Cover Crop Table—Potential Advantages, continued.

Species	Tolerances ⁴					Habit ⁵	pH (Pref.)	Establishment Periods	Min. Germ. Temp.(F)
	Heat	Drought	Shade	Flood	Low Fert.				
LEGUMES									
Hairy Vetch	G	G	G	F	G	U/SU	5.5-7.5	Summer	42
Red Clover	VG	G	VG	G	G	U	5.5-7.0	Spring/Summer	42
Subterranean Clovers	G	VG	VG	G	E	P/SP	5.5-7.0	Late summer	38
Sweet Clover	VG	E	VG	F	E	U	6.5-7.0	Spring/Summer	42
White Clover	G	G	VG	VG	G	P/SU	6.0-7.0	Spring/Fall	40
Woollypod Vetch	VG	VG	G	G	VG	SP/C	6.0-8.0	Summer/Fall	40
Chickling Vetch	G	G	G	G	G	C	5.5-7.0	Late Summer	60
Common Vetch	G	G	G	F	G	U	5.5-7.0	Fall	45
Field Pea	P	G	F	F	F	C	6.0-8.0	Spring/Summer	41
Winter Pea	P	G	F	F	G	C	6.0-8.0	Fall	41
Alfalfa	G	F	F	P	G	U	6.0-7.5	Spring-Fall	40
Mung Beans	E	VG	P	G	E	U	6.2-7.0	Summer	59
Guar	E	E	P	P	E	U	7.0-8.0	Summer	58
Lentils, Spring	P	VG	VG	P	F	U	5.5-7.0	Summer	41
Lentils, Winter	P	VG	VG	P	F	U	5.5-7.0	Fall	41
Fava Bean	P	P	N/O	N/O	G	U	6.0-7.0	Spring	40

Cover Crop Table—Planting Information

Species	Seeds/Pound (average)	Drilled (lbs/A)	Broadcast (lbs/A)	Depth (inches)	Inoculant Type	Reseeds
NON-LEGUMES						
Annual Ryegrass	190,000	12-20	18-30	0.00-0.50		Reliably
Spring Barley	13,600	50-80	75-120	0.75-2.00		Sometimes
Winter Barley	13,600	50-75	75-113	0.75-2.00		Sometimes
Spring Oats	19,600	30-60	45-90	0.50-1.50		Reliably
Winter Oats	14,000	30-64	45-96	0.50-1.50		
Cereal Rye	18,160	55-100	82.5-150	0.75-2.00		Reliably
Spring or Winter Wheat	11,360	40-60	60-90	0.50-1.50		Sometimes
Spring Triticale	22,700	50-90	75-135	0.50-1.50		Usually
Winter Triticale	22,700	50-90	75-135	0.50-1.50		Reliably
Corn	2,500	20-26	30-39	0.75-2.00		Usually
Forage Sorghum	17,280	10-25	15-38	0.50-1.50		Usually
Sorghum- Sudangrass	17,280	15-30	23-45	0.50-1.50		Sometimes
German Millet	220,000	15-20	23-30	0.50-1.00		
Pearl Millet	82,320	20-25	30-38	0.50-1.00		Sometimes
Proso Millet	80,000	20-25	30-38	0.50-1.00		Usually
Safflower	13,600	15-20	23-30	1.00-1.50		Sometimes
Sunflower	7,500	3-8	5-12	1.00-1.50		Sometimes
Turnip	192,800	3-7	5-11	0.25-0.50		Usually
Hybrid Forage Turnip	192,800	3-7	5-11	0.25-0.50		Usually
Teff grass	1,300,000	5-7	8-11	0.25		Sometimes
Oilseed Radish	34,000	4-8	6-12	0.25-0.50		Sometimes
Grazer Radish	50,000	4-8	6-12	0.25-0.50		Sometimes
Mustard	180,000	3-7	5-11	0.25-0.50		Usually
Ethiopian Cabbage	145,000	3-7	5-11	0.25-0.50		Sometimes
Rapeseed/Canola	156,960	3-7	5-11	0.50-1.00		Sometimes
Kale/Collards	175,000	5-9	8-14	0.25-0.75		Sometimes
Buckwheat	20,400	20-75	30-113	0.50-1.00		Reliably
Flax	81,000	20-40	30-60	0.25-0.50		Sometimes
LEGUMES						
Cowpeas	3,600	20-50	30-75	1.00-1.50	Cowpeas/Lespedeza	Sometimes
Crimson Clover	147,760	10-15	15-23	0.25-0.50	Crimson/Berseem	Usually
Soybean	3,000	30-60	45-90	1.00-1.50	Soybean	Usually
Sunn Hemp	15,000	15-20	23-30	1.00-1.50	Cowpea	Never

Cover Crop Table—Planting Information, continued.

Species	Seeds/Pound (average)	Drilled (lbs/A)	Broadcast (lbs/A)	Depth (inches)	Inoculant Type	Reseeds
LEGUMES						
Hairy Vetch	16,300	15-20	23-30	0.50-1.50	Pea/Vetch	Sometimes
Red Clover	272,160	8-12	12-18	0.25-0.50	Red Clover/White Clover	Sometimes
Subterranean Clovers	70,000	10-20	15-30	0.25-0.50	Clovers, sub, rose	Usually
Berseem Clover	206,000	8-12	12-18	0.25-0.50	Crimson/Berseem	Sometimes
Sweetclover	258,560	6-10	9-15	0.25-1.00	Alfalfa/Sweet Clover	Usually
White Clover	776,000	3-9	5-14	0.25-0.50	Red Clover/White Clover	Reliably
Woollypod Vetch	10,000	12-18	18-27	0.50-1.00	Pea/Vetch	Sometimes
Chickling Vetch	2,500	50-60	75-90	1.00-1.50	Pea/Vetch	Rarely
Common Vetch	8,000	15-20	23-30	0.50-1.50	Pea/Vetch	Sometimes
Pea, Field	1,840	50-80	75-120	1.50-3.00	Pea/Vetch	Sometimes
Pea, Winter	1,840	50-80	75-120	1.50-3.00	Pea/Vetch	Sometimes
Alfalfa	147,000	8-15	12-23	0.25-0.50	Alfalfa	Sometimes
Mung Beans	10,000	15-20	23-30	1.00-1.50	Peanut/Lima Bean	Sometimes
Guar	15,000	5-10	8-15	1.00-1.50	Peanut/Lima Bean	Sometimes
Lentils, Spring	9,000	30-80	45-120	1.00-1.50	Pea/Vetch/Lentil	Sometimes
Lentils, Winter	9,000	30-80	45-120	1.00-1.50	Pea/Vetch/Lentil	Sometimes
Fava Bean	3,000	60-75	90-113	1.00-2.00	Pea/Vetch	Rarely

¹ **Crop Type:** **CG**=Cool-Season grass, **WG**=Warm-Season grass, **CB**=Cool-Season Broadleaf, **WB**=Warm-Season Broadleaf

² **Winter Hardiness:** Either adapted to climate statewide, southern Kansas, or not frost tolerant (NFT)

³ **Total N:** Total N benefit from entire plant (Grasses not considered N source)

⁴ **N/O**=Not Observed **P**=Poor **F**=Fair **G**=Good **VG**=Very Good **E**=Excellent

⁵ **Habitat:** **C**=Climbing; **U**=Upright; **P**=Prostrate; **SP**=Semi-prostrate; **SU**=Semi-upright

⁶ **Surface Compaction**

Section

[Kansas State Research and Extension publication MF2866 “Hessian Fly”](#)

[KSU Extension Bulletin “Chemical Weed Control for Field Crops, Pastures, Rangeland and Noncropland”](#)

[USDA NRCS Form KS-ECS-4, Grass Seeding](#)

[USDA NRCS, Form KS-ECS-6, Cover Crop Design](#)

[USDA NRCS Kansas Conservation Practice Standard 528, Prescribed Grazing](#)

[USDA NRCS Kansas Conservation Practice Standard 590, Nutrient Management](#)

[USDA NRCS Kansas Cover Crop Seeding Rate Zones](#)

For additional information about cover crops, please refer to [*Managing Cover Crops Profitably*](#), 3rd Edition. Sustainable Agriculture Network (SAN) is the national outreach arm of the USDA Cooperative State Research, Education, and Extension Service (CSREES), Sustainable Agriculture Research and Education (SARE) program. For more information, visit <https://www.sare.org/>.

For additional information regarding cover crop species and characteristics, refer to the [Midwest Cover Crop Council - Cover Crop Decision Tool](#).

Specific Site Requirements