

Soil First®

PREMIUM COVER CROP SEED

Cover crops are being utilized across the country for a multitude of reasons. Besides soil and water quality benefits, integrating summer, fall and winter cover crops can supply much needed forage in the form of hay, silage and pasture through fall and spring.

SF MIXES	MIX COMPONENTS
SF 101 Cover Starter	Guardian™ Fall Rye + Soil First® Select Radish
SF 102 Cover Starter +	Guardian™ Fall Rye + Soil First® Select Radish + Crimson Clover
SF 120 Extender	Hy Octane Triticale + Fixation Balansa Clover + Soil First® Select Radish
SF 125 N-Hancer	Spring Oats + Soil First® Select Radish + Fixation Balansa Clover + Peas + Crimson Clover
SF 140 Multi-Purpose	Winter Triticale + Soil First® Select Radish + Vivant Brassica + Forage Collards + Peas
SF 142 Classic	Crimson Clover + Soil First® Select Radish
SF 150 Field Fit	Spring Oats + Soil First® Select Radish
SF 160 Rooting	ColdSnap™ Annual Ryegrass + Soil First® Select Radish
SF 165 Late Grazer	Pearl Millet + Sunn Hemp + Soil First® Select Radish
SF 167 Summer Grazer	Sorghum x Sudangrass + Sunn Hemp + Soil First® Select Radish
SF 175 AccuSpread	ColdSnap™ Annual Ryegrass + Crimson Clover + Soil First® Select Radish
SF 180 Shifter	ColdSnap™ Annual Ryegrass + Fixation Balansa Clover + Soil First® Select Radish



		NUTRITIONAL VALUE INFORMATION (Values Vary Greatly Depending on Maturity)																		
ANNUAL COVER CROP FORAGE	Planting Season Spring Summer Late Summ Fall	Seeding Rate (mix) lbs/acre	Seeding Rate (for forage) lbs/acre	Seeding Depth (with drill)	USDA Hardiness Zone	Days to Emergence	Crude Protein	NEL ¹ Mcal/lb	ADF% ²	NDF% ³	TDN	DM Tons per Acre	Days to 1st Harvest	Days to Next Harvest	Ranking Good, Better, Best					
															Graze	Baleage	Chop			
BRASSICA/MUSTARD	Daikon Radish		1-3	5-8	1/4"	9	3-5	18	0.73	26	21	70	2-4	45	-	Best	NR	Good		
	Oilseed Radish		3-8	8-12	1/4"	9	3-5	18	0.73	26	21	70	2-4	45	-	Best	NR	Good		
	Turnips (Top)		2-4	3-8	1/4"	6-7	4-10	16	0.70	23	20	69	2-5	60-80	-	Best	NR	Good		
	Vivant Brassica		2-3	5-6	1/4"	7	4-6	14	-	23	22	78	2-5	35-40	25-30	Best	Better	Good		
	Forage Collards		1-4	10-12	1/4"-1/2"	5	4-10	20	0.74	25	21	70	2-4	35-40	25-30	Best	NR	Good		
	Rapeseed		2-4	6-8	1/4"-1/2"	5	4-10	14	TBD	28	41	57	1.5-4	60-80	-	Good	Better	Best		
	Yellow/White Mustard		2-5	-	1/4"-3/4"	7	5-7	-	-	-	-	-	-	-	-	-	-	-		
LEGUMES	Crimson Clover		4-8	6-15	1/4"	7	7-10	17	0.56	31	42	59	.5-2	60	-	Better	Best	Good		
	Berseem Clover		5-10	15-20	1/4"	8	5-8	18	0.73	23	36	69	1-2.5	60	-	Good	Best	Better		
	Balansa Clover		1-4	3-6	1/4"	5	14	16	TBD	31	45	65	1-4	40-50	-	Better	Good	Best		
	Winter Hairy Vetch		10-20	30-40	1"	3-4	14	26	0.58	33	48	64	1-3	Spring	-	Best	NR	Good		
	Sunn Hemp		5-8	5-15	1/2"-1"	Frost	3-7	25	Varies Greatly			1.5	40-45	-	Best	Good	Better			
	Austrian Winter Peas		10-30	40-60	1"	6+	9	28	0.60	38	54	70	0.5-2	Spring	-	Better	Good	Best		
	Peas (Hay)		10-50	75-120	1"	Frost	9	10	0.60	52	62	60	1.5-3	60-80	-	NA	Good	Best		
	Peas (Silage)		10-50	75-120	1"	Frost	9	16	0.58	44	55	58	1.5-3	60-80	-	NA	Good	Best		
	Peas and Oat Mix		-	75-120	3/4"-1"	Frost	5-9	17	0.57	30	57	59	3-5	60	-	Better	Good	Best		
	Medium Red Clover		6-8	8-12	1/4"	4	7-10	16	0.56	36	46	55	2-5	Spring	40	Better	Best	Good		
GRASSES	Annual Ryegrass		10-15	25-35	1/4"	6	7	9	0.58	38	65	58	.5-2	90	-	Better	Good	Best		
	Spring Oats (Hay)		20-40	80-120	3/4"-1"	7	5-8	10	0.54	39	63	54	3-6	60-70	-	Better	Good	Best		
	Spring Oats (Silage)		20-40	80-120	3/4"-1"	7	5-8	12	0.60	39	59	60	1.5-3.5	80	-	NA	Good	Best		
	Fall Rye (Hay)		20-40	80-120	3/4"-1"	3	5-8	10	0.58	38	65	58	3-5	Spring	-	Good	Better	Best		
	Fall Rye (Silage)		20-40	80-120	3/4"-1"	3	5-8	14	0.59	37	59	59	2.5-4	Spring	-	NA	Good	Best		
	Triticale (Fall)		20-40	80-120	3/4"-1"	3	6-8	12	0.58	41	69	56	2.5-4	Spring	-	Good	Better	Best		
	Triticale (Spring)		20-40	80-120	3/4"-1"	3	6-8	12	0.58	39	56	58	3-4	50-60	-	Better	Good	Best		
	Barley (Fall)		20-40	80-120	3/4"-1"	6	6-8	9	0.57	37	65	57	3-4	Spring	-	Better	Good	Best		
	Barley (Spring)		20-40	80-120	3/4"-1"	6	6-8	12	0.58	37	58	59	2-4	50	-	Better	Good	Best		
	Wheat (Hay)		20-40	80-120	3/4"-1"	3	6-10	9	0.57	38	66	59	2-3	Spring	-	Better	Best	Good		
	Wheat (Silage)		20-40	80-120	3/4"-1"	3	6-10	12	0.59	37	62	59	2-3	Spring	-	NA	Good	Best		
	Forage Sorghum		-	6-20	3/4"-1 1/2"	Frost	10	9	0.59	38	59	59	6-9	80-105	-	Better	Good	Best		
	Sorghum x Sudan		5-20	25-70	3/4"-1 1/2"	Frost	10	16	0.70	29	55	55	5-8	45-70	30	Good	Better	Best		
	Sudangrass		-	20-45	1/2"-1"	Frost	3-5	9	0.57	43	67	57	2-6	50	30	Good	Better	Best		
	Teff Grass		-	8-12	1/4"	Frost	3-5	18	0.60	33	57	64	3-5	35	25	NR	Good	Best		
Pearl Millet		5-20	20-30	1/2"-1"	Frost	3-5	16	0.66	39	48	52	3-6	45	35	Better	Good	Best			
German Millet		5-15	20-25	1"	Frost	3-5	14	N/A	34	60	60	2-4	50	-	Best	NR	NR			
White Proso Millet		5-20	20-30	1"	Frost	3-5	12	N/A	39	72	62	1.5-2.5	50	-	Best	NR	NR			
SOIL FIRST® MIXES	SF 101 Cover Starter		-	40-50	1/4"-1"	-	Varies	10-13	Nutrition values vary due to differences in the forage quality of the mix components and differences in how and when each component is harvested (grazed versus baleage)						2-5	45-50	Spring	Best	Good	Better
	SF 102 Cover Starter		-	40-50	1/4"-1"	-	Varies	12-15							2-5	45-50	Spring	Best	Good	Better
	SF 120 Extender		-	40-50	1/4"-1"	-	Varies	12-16							-	50-60	Spring	Best	Good	Better
	SF 125 N-Hancer		-	40-50	1/4"-1"	-	Varies	14-18							2-5	45-50	-	Best	Good	Better
	SF 140 Multi-Purpose		-	40-50	1/4"-1"	-	Varies	11-14							3-5	45-50	25	Best	Good	Better
	SF 142 Classic		-	15-20	1/4"-1/2"	-	Varies	16-18							2-4	45-60	Spring	Best	Good	Better
	SF 150 Field Fit		-	40-50	1/4"-1"	-	Varies	13-17							2-4	45-50	-	Best	NR	Good
	SF 160 Rooting		-	20-25	1/4"-1/2"	-	Varies	10-14							2-4	45-50	Spring	Best	Good	Better
	SF 165 Late Grazer		-	20-25	1/4"-1"	-	Varies	10-14							2-5	45-50	-	Best	Good	Better
	SF 167 Summer Grazer		-	25-30	1/4"-1"	-	Varies	10-14							3-6	40-45	-	Best	Good	Better
OTHER	Phacelia		1-2	8	1/4"	8	10-14	-	-	-	-	-	-	-	-	-	-	-		
	Sunflower		1-2	3-5	3/4"-1"	Frost	4-10	11	TBD	36	42	63	2-3	Varies	-	Best	N/A	Better		
	Buckwheat		5-20	40-55	1/2"-1"	Frost	3-5	12	0.68	33	44	65	1.5-4	60	-	Better	NR	Good		
	Sugar Beet		1-3	2-5	1/4"	8	-	14	0.58	14	25	58	2-4	60-80	-	Best	NR	Good		
1.	Net Energy for Lactation = Energy available after subtracting digestive and metabolic losses	* +/- 5%. Bulk Density averages are only a guide. Moisture, humidity and seed quality all affect bulk density.	18	0.55	37	49	55	3-8	-	30	N/A	N/A	Best							
2.	Acid Detergent Fiber = Low values mean more digestible	Days to Harvest = Estimations based on average growing season to reach optimum quality	19	0.59	35	45	59	3-8	-	30	Good	Better	Best							
3.	Neutral Detergent Fiber = Low values mean cows can eat more	NA = Not applicable; NR = Not recommended	8	0.74	27	46	72	7-10	120	-	N/A	N/A	Best							

REFERENCES: Texas Tech University, Oklahoma State University, Iowa State University, Mississippi State University, North Dakota State University, Colorado State University, University of Florida, Michigan State University, University of Wisconsin, Kansas State University

Which Cereal Grain Do I Plant for Forage?

Cereal grains are increasingly popular as forage supplements for perennial hay and summer annual acres. Many forage benefits exist for these cereal grain options, but differ in quality/tonnage with management.

SPRING OATS – Spring oats afford early forage production as monocultures or nurse crop in spring pasture or hay. Use as a graze-out program and/or remove any residue prior to the next crop. Rotational grazing often extends window for pasture production. Plant spring oats in fall if early enough for 60 to 90 day production.

FORAGE OATS – Forage oats often have greater leaf-to-stem ratios, forage quality, better intake and digestibility than traditional spring oats. Improved forage oat varieties bring increased resistance to diseases, but not necessarily greater tonnage capability.

Best Use: Silage (milk to dough stage); Hay (late boot to early heading)

SPRING TRITICALE – Triticale, a cross between wheat and rye, makes for a crop with higher yields but lower quality than wheat. Spring triticale is best for grazing pasture and more consistent for hay, silage or feed grain than wheat. Large stems make hay wilting and silage packing difficult. Triticale has better drought tolerance than wheat or spring oats.

WINTER TRITICALE – Winter triticale, often as tolerant to cold conditions as winter wheat but less than winter rye, can be spring-seeded (vernalization will not occur so plants will remain vegetative, not producing seed). Very useful for late summer, fall and spring pasture. Winter triticale typically matures 5 to 7 days later than winter wheat and 2 to 3 weeks later than fall rye under consistent conditions.

Best Use: Fall & Spring Pasture; Silage & Hay (late boot stage for best quality; soft dough for maximum tonnage)

SPRING BARLEY – Spring barley gives an adaptive forage option with high digestibility and good cold, alkaline soil and drought tolerance. Unlike spring oats, spring barley hasn't been used as a nurse crop due to lodging incidence. 2-row varieties tend to be more competitive, than alfalfa for example, due to extensive tillering. 6-row varieties have more kernels and less tillering. New varieties bring better resistance to lodging and smooth awns - critical for proper palatability.

- 2-row barley – lower protein content, but more fermentable sugar content = typically better for malting
- 6-row barley – higher protein content = better for forage

WINTER BARLEY – Winter barley is very susceptible to winterkill; consider when grazing late into the fall. Because early planting ensures greater survivability, it provides a valuable source of early fall pasture. Assuming winter survival/vernalization, remove livestock prior to jointing/stem elongation to avoid stand loss. Jointing occurs earlier than wheat or triticale. Barley matures 1 to 2 weeks before wheat, allowing more flexibility with double cropping.

High moisture barley value as a feed grain is the most comparable to whole-plant corn (90-100%). This is gaining favor in many regions and spreads out the work load because of earlier harvest vs. corn.

Best Use: Fall Pasture; Silage & Hay (boot to dough stage)

WINTER RYE – With great cold tolerance, rye is easiest to establish in poor soils, and is great for hay production or pasture ground due to quick growth in both fall and early spring.

Best Use: Fall, Winter & Spring Pasture

WINTER WHEAT – Wheat has good potential for forage and is usually higher in quality than rye, triticale and oats but often produces more dry matter overall than barley.

Best Use: Fall & Spring Pasture; Hay (boot to milk stage); Silage (boot to dough stage)

- Hard Red Winter – high in protein (10 to 12%), more gluten (used for yeast and bread flour) and grown in more arid climates where the incidence of grain quality issues can be minimized from too much moisture
- Hard Red Spring – even higher in protein (12 to 14%)
- Soft Red Winter – higher carbohydrates, less gluten and planted in areas that can tolerate more moisture (areas east of the Mississippi River)

HAY PRODUCTION - Hay often yields an average 2 to 4 tons/acre with moisture content between 15 to 20%, and is more maturity-dependent at harvest than silage. Harvesting at early-milk stage allows for the greatest forage yield but greatest quality occurs in the late-boot stage. To speed up drying in the late-boot stage, a crimper is recommended.

SILAGE PRODUCTION - Silage yields 4 to 7 tons/acre of 35% dry matter forage in the boot stage and 6 to 10 tons/acre when in the late boot stage. Ensilage small grains between 62 to 68% moisture. Chop length should be finer than corn or forage sorghum harvest.

(Kansas State University)



SMALL GRAIN	TONNAGE POTENTIAL	QUALITY RATING	TIME OF PLANTING	BEST USE & TIME OF HARVEST	IMPORTANT MANAGEMENT CONSIDERATIONS
Spring Oats	++++	++++	March - April; July - September	Silage - milk to dough stage; Hay - late boot to early head	Late summer or fall planting should be made at least 60-75 days prior to first frost for maximum tonnage potential. Rotational grazing is recommended when pasturing to ensure longevity.
Forage Oats	++++	++++			
Spring Triticale	++++	+++++	March - April; July - August	Fall & Spring Pasture; Silage & Hay (late boot for best quality; soft dough for maximum tonnage)	Larger stems can make hay wilting and silage packing difficult. Typically matures about 1 week later than winter wheat and 2-3 weeks later than winter rye.
Winter Triticale	++++	+++++	August - October		
Spring Barley	+++	+++++	March - April; July - August	Fall Pasture; Silage & Hay (boot stage for best quality; soft dough for maximum tonnage)	Spring barley has tendency to lodge when used as nurse crop (compared to oats). Winter barley is the most susceptible to winter injury of all the cereals. If pasturing, remove livestock prior to jointing to lessen risk of stand loss.
Winter Barley	+++	+++++	August - September		
Winter Rye	+++++	+++	August - November	Fall, Winter, & Spring Pasture	Quickest to "wake up" in spring so proper management is needed to synchronize tonnage and quality.
Spring Wheat	++++	+++++	March - April; July - August	Fall & Spring Pasture; Silage (boot to dough stage); Hay (boot to milk stage)	Early planted wheat may serve as a host to many diseases such as wheat streak and barley yellow dwarf mosaics, which decrease forage production. Hessian fly infestations are also common in early plantings.
Winter Wheat	++++	+++++	August - October		
+ = poor +++++ = greatest					

Tips for Managing Summer Annuals and other Cover Crops for Forage

When the opportunity exists to plant early, warm season annuals provide large amounts of biomass while easing compaction, improving soil tilth and absorbing excess nutrients left behind from cash crops. These grasses provide quality forage suitable for all classes of ruminants (usually during periods where traditional perennial crops are less effective). Although referred to as "emergency forage", these mixes can be part of a planned cover crop program where the dual benefit of forage is the goal.

NITRATE TOXICITY is common when fertility or manure applications are followed by a period of drought or stress. Cut plants do not lessen in their nitrate levels as they cure. If high levels are suspected, forage should be tested for a period of a few weeks until levels subside. Though often linked to summer annual grasses, increased nitrate levels can show up in most cover crops and forages.

1. Nitrates are concentrated more in the lower stalk – raising cutting height can reduce the risk
2. When a stressful drought precedes a moisture event, it is recommended to delay harvest by 1 - 2 weeks
3. Consider split applications of nitrogen (especially useful on summer annuals) to decrease nitrate accumulations

PRUSSIC ACID poisoning can occur when feeding forage sorghums after

periods of drought or other stress, including frost. Toxic levels dissipate usually after 2 - 3 weeks and will further decrease when ensiled. Prussic acid is most concentrated in new growth, so sorghum forages should not be grazed until they are at least 18" tall. Storing hay or silage for at least 30 days generally dissipates the concern.

BRASSICA CROPS can cause animal health disorders if not grazed properly. Introduce grazing animals to brassica pastures slowly (usually over 3 - 5 days). With extremely high forage values, brassicas can cause problems if hungry animals are turned out into predominate brassica pastures. Even though traditional recommendations allow for 2/3, we actually recommend keeping brassicas to under 1/3 of the grazing animal's diet - always supplement brassicas with dry hay or other grasses (higher in fiber).

BLOAT can be an issue with most legume species. Reduce bloat by:

1. Utilizing grasses alongside the legumes
2. Pre-fill livestock with coarse hay prior to turning onto pasture, ensuring animals are not turned out to fresh pasture when hungry
3. Do not start grazing when the pastures are wet from dew or rain

GRASS TETANY can occur when grazing lush cereal grain crops in the spring or fall. Tetany risk can be lessened by adding legumes (which offset low magnesium levels that induce tetany) and by keeping livestock out of fields recently fertilized or manured.