COVER CROP PRODUCTS

CRITICAL COVER CROP DECISION MAKING CONSIDERATIONS

1. PLANTING WINDOW: WHAT IS THE PLANTING WINDOW FOR THE COVER CROP?

SPRING COVER COOL SEASON · FEB-MAR-APR	**SUMMER COVER** WARM SEASON · JUN-JUL	**FALL-WINTER COVER** COOL SEASON · AUG-MID SEP
Buckwheat, Oats, Cool Season Peas, Spring Barley, Spring Triticale	Sorghum Forages, Millets, Cowpeas, SunnHemp, Hybrid Brassica, Safflower, Flax, Buckwheat	Cool Season Peas, Lentils, Chickling Vetch, Crimson Clover, Tillage Radishes, Turnips, Ethiopian Cabbage, Oats, Triticale, Annual Ryegrass

2. COVER CROP OBJECTIVES: WHAT ARE THE PRIMARY GOALS OF THE COVER CROP?

OBJECTIVE	GENERAL PURPOSE	COVER CROP SPECIES
Nitrogen Fixing	To generate nitrogen credits beneficial for the next primary crop.	Cool Season Peas, Cowpeas, SunnHemp, Chickling Vetch, Hairy Vetch, Clovers, Alfalfa
Nutrient Scavenge	To consume and temporarily sequester (tie-up) nitrogen or to reclaim unreachable reservoirs of nutrients.	**N Scavenge:** Millets, Oats, Triticale, Annual Ryegrass. **P Scavenge:** Brassicas including Tillage Radish, Hybrid Brassicas, Sunflower.
Mulching and Organic Matter	To improve soil health (moisture retention and water holding capacity) as well as to reduce soil erosion.	Oats, Triticale, Annual Ryegrass, Millets, SunnHemp
Soil Conditioning	To reduce soil compaction, fracture hard-pan, and generally improve soil structure.	Tillage Radish, Annual Ryegrass, Hybrid Brassica
Soil Pest Management	To suppress nematodes and disrupt pest cycles.	SunnHemp (many species including soybean cyst), Annual Ryegrass (suppresses SCN), Sorghum sudan (many species but not SCN), Ethiopian cabbage
Upland Birds	Creates brood rearing cover when planted in the spring through late summer.	Cowpeas, Cool Season Peas, Yellow Blossom Clove, Hybrid Brassica, Buckwheat, Sunflower, SunHemp

3. CROP ROTATION: WHAT IS THE INTENDED PRIMARY CROP FOLLOWING COVER?

CORN	Corn is best preceded by legumes (like SunnHemp, Cowpeas, Chickling Vetch, or Cool Season Peas) and brassicas (like Tillage Radish, Hybrid Brassica, and Turnip). These are plants that either produce nitrogen or decay quickly to release nitrogen and/or other nutrients they have scavenged and stored.
SORGHUM	Sorghum is best preceded by the same crops as corn. In addition, Crimson Clover and Hairy Vetch can also be included because the later sorghum planting date allows these species to bring value as well.
SOYBEANS	Soybeans are best preceded by crops that sequester nitrogen such as annual Ryegrass and Rye. These crops will tie up nitrogen the next spring, suppressing weed pressure in soybeans while slowly decaying to release nitrogen later in the soybean crop when beans are podding.
WHEAT	Wheat is best preceded by legume dominated mixtures. A cover crop can be utilized during traditional fallow periods such as spring seeded mix of Oats that produce a light colored, persistent mulch, as well as legumes to provide a slow release nitrogen source. It is recommended to terminate or harvest spring seeded covers by mid-June to allow time for a rain to recharge the profile prior to wheat planting. In areas suited to continuous wheat, a summer legume such as SunnHemp or Cowpeas planted immediately after harvest and terminated a month prior to wheat planting fixes nitrogen and produces a rapidly decaying mulch to release that nitrogen. SunnHemp also leaves a stiff-stalked residue that excels at trapping snow.

CONSIDERATIONS
FOR COVER CROP MIXES

QUICK PICK Cover Crop Selection		Intended Primary Crop After Cover Crop		
		SOYBEANS	CORN/SORGHUM	WHEAT
Current Primary Crop Before Cover Crop	SOYBEANS	**Rye or Annual Ryegrass** Seed following soybean harvest. May be seeded as late as mid-November.	**GreenWing B2C** Seed into standing beans when leaves yellow; a mix designed for aerial application. Requires irrigation or timely rainfall to initiate seed establishment.	**Green-Up or Green Spring** Fallow alternative: Seed in March and terminate by mid-June to recharge moisture before fall wheat planting.
	CORN/SORGHUM	**GreenWing C2B** Seed into standing corn when corn matures and canopy opens; a mix designed for aerial application.	**GreenWing B2C** Seed into standing corn when corn matures and canopy opens; a mix designed for aerial application.	**Green-Up or Green Spring** Fallow alternative: Seed in March and terminate by mid-June to recharge moisture before fall wheat planting. **Chick Magnet** A combination of cool and warm season broad leaves designed primarily for providing brood cover to upland game birds, but it has legumes for nitrogen fixation and deep top rooted crops for benefit to succeeding crops.
	WHEAT	**GreenShift SB** Seed in August through early September; options include mix with Oats (winter kills), Triticale (does not winter kill; produces hay or graze), or Annual Ryegrass (does not winter kill; produces graze.)	**GreenShift CS or Chickling Vetch** Seed in August through early September. Oats can be added to the GreenShift CS to produce a very productive fall grazing cover crop. **Chick Magnet** A combination of cool and warm season broad leaves designed primarily for providing brood cover to upland game birds, but it has legumes for nitrogen fixation and deep top rooted crops for benefit to succeeding crops. **No-Vol CS** An all broad leaf blend designed to allow over-the-top use of grass herbicides to kill volunteer wheat and reduce risk of transmitting wheat streak mosaic.	**SunnHemp or Green Field** For continuous wheat cropping, seed immediately following wheat harvest, terminate prior to fall wheat seeding. **Chick Magnet** A combination of cool and warm season broad leaves designed primarily for providing brood cover to upland game birds, but it has legumes for nitrogen fixation and deep top rooted crops for benefit to succeeding crops.

Maximize Performance: A mix can accomplish multiple objectives at the same time, better than a single species. For example, a half-seeding rate of Tillage Radish may provide nearly as much compaction alleviation as a full rate, while a half seeding rate of field peas can fix nearly as much nitrogen as a full rate. Combining a half-seeding rate of each can accomplish both objectives at the same time.

Reduce Risk of Seeding Failure: Mix diversity reduces the risk of seeding failure, insect problems, diseases, variable soils, etc. A diverse mix will often exhibit the phenomenon of "over-yielding" in which the total yield far exceeds the weighted average of the components in the mix.

Mix Design: Many factors must be considered when developing cover crop mixes. For example, mixing species may reduce herbicide options in the event weed control is needed or may be limited dependent upon previous herbicide use. Species compatibility is important; some species during certain seasons may be so dominant that mixing other species brings little value (such as Rye in a very late fall planting). Conversely, some species may not compete well in a mix yet have great value when planted alone (such as Chickling Vetch).

FEATURED MIXES DESIGNED FOR THE STAR SEED DEALER NETWORK

MIX	PLANTING WINDOW	MIX DESCRIPTION & BEST USE
Green Spring	**SPRING COOL SEASON** Feb-Mar-Apr 65-105 lbs/a	Designed to be planted in March to produce an early hay or pasture crop, or simply left in place to convert the ordinarily abundant spring rain into a water-saving mulch, improving late-season drought tolerance. In areas with more abundant rain, it can precede soybeans or sorghum; in more droughty areas, it is used prior to wheat and is recommended to be terminated by mid-June to allow soil profile recharge. **OATS, COOL SEASON PEAS**
Green Up	**SPRING COOL SEASON** Feb-Mar-Apr 63-85 lbs/a	Green Up is similar in function to Green Spring but with five (5) species for increased diversity and better adaptability to variable soils. It is designed to be planted in spring to produce early hay or pasture or can remain undisturbed to convert spring rain into a water-saving mulch. In areas with more abundant rain, it can precede soybeans or sorghum; in more droughty areas, it is used prior to wheat and it should be terminated by mid-June to allow soil profile recharge. **OATS, COOL SEASON PEAS, SPRING BARLEY, CHICKLING VETCH, SPRING TRITICALE**
Chick Magnet	**SPRING COOL SEASON** Feb-Mar-Apr 20-25 lbs/a	A combination of cool and warm season broad leaves designed primarily for providing brood cover to upland game birds, but it has legumes for nitrogen fixation and deep top rooted crops for benefit to succeeding crops. **COWPEAS, COOL SEASON PEAS, YELLOW CLOVER, WIN HYBRID BRASSICA, SUNFLOWER, BUCKWHEAT**
Green Field	**SUMMER WARM SEASON** May-Jul 20-30 lbs/a	Six (6) mixed species designed to agronomically contribute to organic matter, fix nitrogen, scavenge nutrients, and condition soil. Green Field also provides the option for supplemental grazing and later season hay potential. **SORGHUM SUDAN, HYBRID PEARL MILLET, COWPEAS, HYBRID BRASSICA, SUNFLOWER, RADISH**
No-Vol CS	**SUMMER WARM SEASON** May-Jul **AND COOL SEASON** Feb-Mar-Apr 28-40 lbs/a	An all broadleaf blend designed to allow over-the-top use of grass herbicides to kill volunteer wheat and reduce risk of transmitting wheat streak mosaic. **COOL SEASON PEAS, COWPEAS, CHICKLING VETCH, RADISH, PURPLE TOP TURNIP**
GreenShift SB	**FALL COOL SEASON** Aug-Sep 48-78 lbs/a	GreenShift SB mix is designed for fall cover crop preceding soybeans the next spring. The grass based components will sequester nitrogen to prevent N loss during the winter and then reduce weed pressure the following spring while the other components condition the soil and contribute bio-diverse eco structure. **OATS, ANNUAL RYEGRASS, WINTER TRITICALE, COOL SEASON PEA, RADISH, HYBRID BRASSICA**
GreenShift CS	**FALL COOL SEASON** Aug-Sep 32-65 lbs/a	GreenShift CS is designed for fall cover crop preceding nitrogen hungry corn or sorghum the next spring or summer. The heavy legume cool season pea based mix will fix nitrogen for the corn and/or sorghum to follow while the other grass and mixed species provide quick fall cover to reduce erosion and increase snow catch through the winter. **COOL SEASON PEAS, OATS, SPRING BARLEY, RADISH, HYBRID BRASSICA**
GreenWing B2C	**FALL COOL SEASON** Aug-Sep 12-18 lbs/a	Designed for aerial seeding into soybeans at leaf yellowing under irrigation or with timely rainfall and to precede corn (B2C, stands for Beans To Corn). It is composed of species that have a low seeding rate, have small seeds that germinate from the surface, and do not produce protruding roots (like radishes) that may interfere with soybean harvest if harvest is delayed. This mixture is composed of legumes and brassicas to produce and then rapidly release nitrogen to a following corn crop. **CRIMSON CLOVER, SWEET CLOVER, HAIRY VETCH, RAPE SEED, HYBRID BRASSICA**
GreenWing C2B	**FALL COOL SEASON** Aug-Sep 22-35 lbs/a	Designed for aerial seeding into standing corn, prior to growing soybeans the following year. (C2B stands for Corn to Beans) sequester nitrogen to prevent N loss during the winter and then reduce weed pressure the following spring while the other components condition the soil and contribute bio-diversity. **ANNUAL RYEGRASS, SPRING TRITICALE, OATS, SWEET CLOVER, RAPE SEED, TURNIP**

FEATURED MIXES DESIGNED FOR THE STAR SEED DEALER NETWORK

COVER SPECIES	PURE STAND SEEDING RATE, LBS/ACRE	SEEDING DEPTH, INCH	SEEDING SEASON
GRASSES			
Annual Ryegrass	20-25	0-.5	Fall
Winter, Spring Barley	60-90	1-2	Spring, Fall
Spring, Winter Triticale	60-120	1-1.5	Fall, Spring
Oats	60-90	1	Spring, Fall
Cereal Rye	60-120	1-2	Fall
German Millet	15-25	0-.5	Spring, Summer, Fall
Japanese Millet	15-25	0-.5	Spring, Summer, Fall
Proso Millet	15-25	.5	Spring, Summer, Fall
Pearl Millet	12-15	.5-1	Spring, Fall
Sudan	15-20	.5-1	Spring, Fall
BRASSICAS			
Appin, Purple Top Turnips	3-5	0-.5	Fall, Spring
Daikan Radish	6-8	.5-.75	Fall
Ethiopian Cabbage	5	0-.5	Fall
Kale	3-5	0-.5	Spring, Fall
Pajsa*, Winfred*	5	0-.5	Spring, Fall, Summer
Rapeseed	4-8	0-.5	Fall, Spring
BROADLEAFS			
Buckwheat	40-60	1	Spring, Fall
Collards	8	.5	Summer, Fall
Flax	30-50	1	Spring, Fall, Summer
Phacelia	5-10	.25	Spring, Fall
Safflower	15-20	1	Summer
Sunflowers	4-7	1-2	Summer
LEGUMES			
Austrian Winter Pea	30-60	1-2	Fall
Berseem Clover	10-12	0-.5	Spring
Chickling Vetch	20-50	1-2	Spring, Fall
Hairy Vetch	20	.5-1	Fall
Cowpeas	30-60	1	Summer
Mung Beans	15-20	1	Summer
Crimson Clover	10-20	0-.5	Fall
Spring Field Peas	60-100	1-2	Spring, Fall
Sunn Hemp	20	.5-1	Summer
Sweetclover Yellow/White Blossom	10-12	0-.5	Spring, Fall

MANY OTHER SPECIES AVAILABLE

COVER CROPS CONVERT ENERGY TO ORGANIC MATTER

› **INCREASED WATER HOLDING CAPACITY**
Organic matter has a very high water holding capacity that can be utilized by plant roots as the soil dries out.

› **RELEASE OF NUTRIENTS**
When organic matter is mineralized in the summer months nutrients become available to the plant.

› **INCREASE WATER INFILTRATION**
With improved soil structure and water holding capacity, the permeability of the soil can be greatly increased.

› **IMPROVE SOIL STRUCTURE**
Abundance of organic matter along with soil biology can help form soil aggregates.

WHAT ARE THE BENEFITS OF ORGANIC MATTER?

› **NUTRIENT SUPPLY**
Organic matter is a reservoir of nutrients that can be released to the soil. Each percent of organic matter in the soil releases 20 to 30 pounds of nitrogen, 4.5 to 6.6 pounds of P2O5, and 2 to 3 pounds of sulfur per year. The nutrient release occurs predominantly in the spring and summer, so summer crops benefit more from organic-matter mineralization than winter crops.

› **WATER-HOLDING CAPACITY**
Organic matter behaves somewhat like a sponge, with the ability to absorb and hold up to 90 percent of its weight in water. A great advantage of the water-holding capacity of organic matter is that the matter will release most of the water that it absorbs to plants. In contrast, clay holds great quantities of water, but much of it is unavailable to plants.

› **SOIL STRUCTURE AGGREGATION**
Organic matter causes soil to clump and form soil aggregates, which improves soil structure. With better soil structure, permeability (infiltration of water through the soil) improves, in turn improving the soil's ability to take up and hold water.

› **EROSION PREVENTION**
This property of organic matter is not widely known. Data used in the universal soil loss equation indicate that increasing soil organic matter from 1 to 3 percent can reduce erosion 20 to 33 percent because of increased water infiltration and stable soil aggregate formation caused by organic matter.

KEYS TO COVER CROP SUCCESS

1. PLANNING CROP ROTATION

Look 3 to 5 years down the road and the possibility of cover crops to enhance flexibility and value.
Simple rotation rule… alternate grass and broadleaf crops (G-G).

GRASS CROPS
- Corn
- Sorghum
- Wheat
- Millets
- Triticale
- Oats
- Barley
- Rye

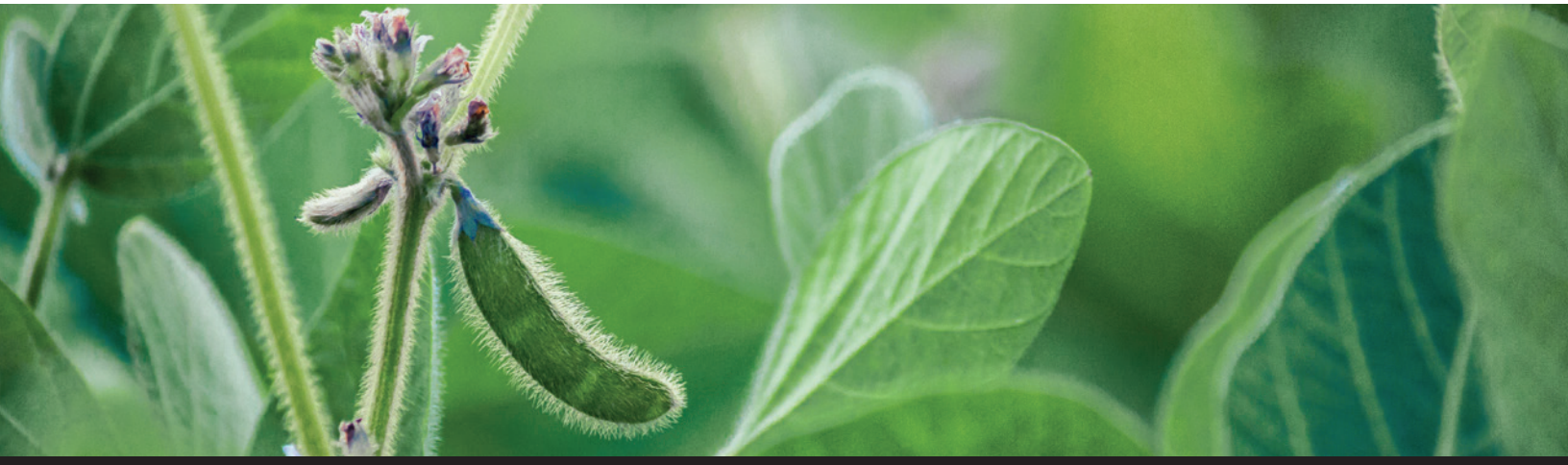
BROADLEAF CROPS
- Soybeans
- Sunflower
- Brassicas (turnips and radish)
- Cowpeas
- Winter Peas
- Chickling Vetch
- Alfalfa
- Clovers

2. LOOK AT THE BIG PICTURE AND CONSIDER THE MANAGEMENT IMPLICATIONS OF ONE CROP UPON THE NEXT

- Weed Control
- Growing Season
- Fertility Management
- Residue Management

3. PATIENCE AND REALISTIC EXPECTATIONS

Long-term challenges such as soil loss, low organic matter, soil structure, pest pressures, and fertility deficiencies require long-term management strategies to manage, correct, and then build upon.



CONSIDERATIONS CONCERNING NITROGEN AND COVER CROPS

Legume cover crops can be used to fix atmospheric nitrogen and incorporate it into their tissues, which is released upon decay of the residue. It is important to match the proper strain of rhizobia inoculant to the species of plant you intend to plant. Soybean inoculant will not nodulate alfalfa or any other legume. Refer to this table to match the correct bacteria to the plant you grow.

PLANT	INOCULANT
Alfalfa, Sweetclover	Alfalfa
Red Clover, White Clover, Ladino Clover, Crimson	Clover
Peas, Vetch	Pea
Soybeans	Soybean
Cowpeas, Peanut, Lespedeza, SunnHemp, Partidge Pea	Peanut

Nitrogen is in plants in the form of protein. When the protein breaks down, it releases nitrogen. There is very little breakdown of legume residue below 50 F. Crops that do most of their growth during the cool weather, like wheat, will not respond as well to legume cover crops as well as warm season crops like sorghum and corn.

The “slow release” nature of nitrogen from cover crops can be advantageous in conditions in which readily available nitrogen sources can be lost. Nitrate nitrogen can be lost from either leaching or denitrification under conditions of standing water or high rainfall; ammonia sources of nitrogen are rapidly converted into nitrate nitrogen. Since nitrogen in cover crop residue is in the form of protein, it is not subject to loss until it is thoroughly decayed.

Cover crops can also be used to reduce the amount of available nitrogen in the soil and convert it into protein. In areas where nitrate leaching into groundwater is a concern, high nitrogen uptake covers like Cereal Rye, Annual Ryegrass, Triticale, and Sudangrass are very effective at taking up excess nitrate and sequestering it for a long period of time. Brassica crops can take up nitrogen from deep in the soil profile and deposit it into their taproots. Since brassicas decay very rapidly their nitrogen taken in is available rather quickly.

SPECIES	TEMPERATURE
Fracking Radish	20°
Purple Top Turnip	10°
Rapeseed	0°
Winfred	0°
Collard	5°
Hairy Vetch	-20°
Spring Forage Pea	20°
Austrian Winter Pea	10°
Crimson Clover	5°
Red Clover	-10°
Yellow Sweet Clover	-10°

KILLING FREEZE THRESHOLDS FOR BRASSICAS AND LEGUMES

Sometimes it is convenient to use the weather to help us terminate our cover crops. Generally speaking warm season cover crops will die at or around 32° F. However, cool season brassicas and legumes can have a wide range of winter kill temperatures. This chart provides a general idea of thresholds some of these species can withstand.

COVER CROP FORAGES

MOST COVER CROPS CAN BE USED FOR GRAZING
AND CAN PROVIDE BOTH HIGH YIELDS AND HIGH QUALITY.

Doesn't grazing reduce the value of cover crops?
Since mulch is a major benefit of cover crops, it is often assumed that grazing will reduce the benefit of cover crops. While true that grazing to the point where the soil is left bare will reduce cover crop benefits, moderate grazing that leaves enough residue to provide full soil coverage can be used to realize immediate cash returns to cover cropping. It is becoming more evident that much of the improved drought tolerance seen following cover crops is due to enhanced microbial activity in the soil, and the deposition of manure pats creates a perfect growing medium for soil microbes. Although only a small percentage of the soil gets covered by manure pats during the grazing of a single cover crop, if cover cropping and grazing are continued over several years then a higher and higher amount of soil gets permanently improved by manure pats.

Doesn't grazing cause compaction?
Many landowners do not want cattle grazing on their land because they are afraid of compaction. The University of Nebraska has conducted over 100 grazing trials on corn stalks to see if grazing stalks has a negative effect on yields of subsequent crops. These trials encompassed both no-till and conventional tillage, both continuous corn and corn-soybean, both fall and spring grazing, and soil types ranging from sandy to heavy clay. In no trial was yield decreased from stalk grazing. The depth of compaction is directly related to the total weight of the compacting agent, in this case a cow. Compaction caused by cattle is relatively shallow and is usually alleviated through natural processes of freezing and thawing, wetting and drying and action of plant roots and soil organism (earthworms, fungi, bacteria, etc.). Compaction caused by vehicles, tractors, combines and grain carts is much deeper and less likely to be removed by natural processes. Since many of the cover crops that can be used for grazing have very aggressive root systems that can break up compaction, having a system of grazed cover crops can actually reduce compaction over time. Additionally, a soil with additional root mass, additional surface residue and additional organic matter is much l ess subject to compaction than unprotected soil.
A cover-cropped, no-till soil usually has a firm sod-like condition that resists compaction. If pugging during extreme mud is a concern, planning for a means by which livestock can be removed during wet conditions to a perennial pasture sod, a rocky area, or a fenced off sacrifice area can spare an entire field from pugging that can create planting issues.

Why should I plant cover crops for grazing if I have plenty of grass?
Perennial grass pastures are most productive and nutritious during the first half of the growing season. About 70% of total pasture production of cool-season pastures like brome and fescue is produced in April, May and June, while 70% of native grass production is produced in May, June, and July. However, the nutrient demands of a typical spring calving cowherd are increasing as the season progresses at the same time the forage production is decreasing. Cover crops can be selected to provide grazing during times when perennial pastures are not productive or are not nutritious. Additionally, grazing cover crops rather than perennial grasses can allow for rest during critical times of grass growth, like late summer for native grass. This can result in better, deeper root formation and more drought tolerant pastures in future years.

COVER CROP FORAGES

COVER CROPS FOR LATE SUMMER GRAZING:

- Sorghum sudangrass (Brown Mid-Rib varieties most nutritious)
- Pearl Millet
- Crabgrass
- Japanese Millet
- Teff Grass
- Cowpeas
- Forage Soybeans
- Annual Lespedeza

COVER CROPS FOR FALL GRAZING:

- Oats
- Spring Barley
- Winfred Hybrid Brassica
- Turnips
- Radish
- Spring Field Peas
- Chickling Vetch
- Spring Seeded Sweetclover
- Winter Barley
- Rye
- Winter Triticale
- Wheat (varieties differ greatly)
- Annual Ryegrass
- Crimson Clover

COVER CROPS FOR WINTER GRAZING:

- Stockpiled male-sterile BMR Forage Sorghum, or late-planted long maturity BMR Forage Sorghum
- Fall planted Oats
- Fall planted Spring Barley
- Rye (most active winter growth)

COVER CROPS FOR SPRING GRAZING:

- Fall planted Rye (earliest to green up), Triticale (best total tonnage for mechanical harvest), Winter Barley, Wheat, Ryegrass (last to green up, but best quality and most regrowth)
- Fall planted Hairy Vetch or Crimson Clover
- Spring planted Oats or Spring Barley
- Spring planted Field Peas or Chickling Vetch

GUIDELINES FOR ROTATIONAL STOCKING OF SELECTED FORAGE CROPS[1]

	BEGIN GRAZING	BEGIN GRAZING[a]	DAYS OF REST
		Target Height (inches)	
Alfalfa (hay types)	10-16	2-4	35-40
Alfalfa (grazing types)	10-16	2-4	15-30
Clover, white[b]	6-8	1-3	7-15
Clovers, all others[b]	8-10	3-5	10-20
Pearl millet	20-24	8-12	10-20
Ryegrass, annual	6-12	3-4	7-15
Small grains	8-12	4	7-15
Sorghum, forage	20-24	8-12	10-20
Sorghum/sudan hybrids	20-24	8-12	10-20

[a]The nutritional requirements of the livestock being grazed should be considered when deciding when to end grazing. The closer a pasture is grazed, the lower forage quality will be toward the end of that particular grazing cycle. Greater residual heights may be desired for animals with higher nutritional requirements (for example, stocker cattle vs. cows and calves).

[b]Clovers are typically grown in pastures in mixtures with grasses. White clover and subterranean clover are quite tolerant of close defoliation; most other clovers are not.

[1]Source: *Rotational Grazing* Publication (ID: 143) from the University of Kentucky Extension Service.

RECOMMENDED STAGES TO HARVEST VARIOUS HAY CROPS[2]

PLANT SPECIES	TIME OF HARVEST
Alfalfa	Bud stage for 1st cutting, 1/10 bloom for 2nd and later cuttings. For spring seedings, allow the 1st cutting to reach mid-to-full bloom.
Orchardgrass, Timothy, Tall Fescue	Boot to early head stage for 1st cut, aftermath cuts at 4 to 6 week intervals.
Red, Arrowleaf, Crimson Clovers	Early bloom.
Oats, Barley, Wheat	Boot to early head stage.
Soybean	Mid-to-full bloom and before bottom leaves begin to fall.
Annual Lespedeza	Early bloom and before bottom leaves begin to fall.
Ladino Clover, White Clover	Cut at correct stage for companion grass.
Hybrid Bermudagrass	15-18 inch height for 1st cutting; thereafter every 4 to 5 weeks.
Birdsfoot Trefoil	Cut at correct stage for companion grass.
Sudangrass, Sorghum Sudan Hybrids, Pearl Millet	Height of 30-40 inches.
Smooth Bromegrass	Boot to mid-bloom.
Big Bluestem, Indiangrass, Switchgrass	Early head stage.

[2]Adapted from: J.D. Burns, J.K. Evans, and G.D. Lacefield, *"Quality Hay Production," Southern Regional Beef Cow Calf Handbook*, SR 5004. (Appendix A.26).

HOW DO I SET MY DRILL
FOR THIS COVER CROP BLEND?

› **43,560 ft²/acre**
(wheel circumference ft x drill width ft) = Tire revolutions to cover 1 acre

Example: If you had a 12 ft drill with a drive tire that covers 8 ft, your equation would look like this:

› **43,560 ft²/acre** **43,560 ft²**

(8 ft x 12 ft) = 96 ft² = **453.75 tire rotations to reach 1 acre**

To make calibration a little easier, you can divide it down into a tenth of an acre, so you do not need to spin your tire as many times. This can be done by dividing your rotations by ten and then your pounds per acre by ten.

Example: If you need to rotate your tire 453.75 times to reach 1 acre, and you are wanting to plant 60 lbs per acre, your 1/10th equations would be as follows.

453.75 rotations **60 lbs/acre**

10 = **45.375 revolutions for .1 acre** 10 = **6.0 lbs/ .1 acre**

After spinning your tire slightly over 45 times, the weight of seed collected should be around 6.0 lbs., if it is not, adjust the drill setting and spin the tire again to see how close you are to the desired weight.

Now some of these are just arbitrary numbers, your numbers will most likely be different in some way than what is given in the examples. The only number that stays as a constant is the square feet within an acre, because that number will never change. As long as you follow the same basic steps as shown above you should be able to reach the right calibration.