



FORAGE

+

COVER CROP

RESOURCE GUIDE

2018

MAKE YOUR FARM YOURS AGAIN®

Welcome to our 2018 Seed Resource Guide.

It is amazing to me how quickly time flies. It seems like our last edition just went to print, and it is now time to introduce our 2018 lineup. As always, we strive for excellence in all we do at Prairie Creek Seed. I hope as you read this new resource guide you'll discover ways to improve your operation, as we share what we've learned in developing and testing products designed for success in the Upper Midwest.

The updates in this catalog go beyond new blends or the latest variety, however. Our team shares a passion for innovative agriculture, and we love working with farmers and ranchers who have the same core beliefs and passion for excellence. It is the innovators and first responders who pave the way for future generations to enjoy the gift of production agriculture. Without these people—farmers like you—we would not be where we are today at Prairie Creek Seed.

Here at our headquarters, we have grown and adjusted to meet the demands for better seed varieties, but more important, for better service to you in providing sound advice for your operation. This past winter we installed a new blender that can mix multiple species to a high degree of accuracy in a very short time. Coupled with a faster bagging system, this blender dramatically reduces the turn time from order to shipping. Whether you need a grazing pasture blend or a cover crop, we will blend to suit, with very reasonable minimums.

I have always said that I am not so smart that I know everything there is to know. Management, goals and resources are different from farm to farm, so why should we make a one-fits-all package? Yes, we still carry our floor blends. They have been developed over time for good reasons. One may fit your needs, but if it doesn't, we will do our best to accommodate you.

You are our highest priority, and we want to show it. We hope you enjoy this resource guide, and we sincerely thank you for your business. Whether you're an established customer or working with us for the first time, we appreciate your choice of Prairie Creek Seed.

Karl Dallefeld, President,
and the Prairie Creek Seed Team



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ALFALFA

Prairie Creek Seed works carefully with the very best genetic companies to select the alfalfa varieties we offer, and our criteria include much more than yield. Forage quality and sound agronomics drive our decision to release or renew each variety, and we look forward to helping you select the best alfalfas to meet your goals.

Prairie Creek Seed alfalfas and clovers are available either pre-inoculated or with Apex™ seed coatings. With Apex-coated seeds you get more plants/bag, even though you are actually planting fewer seeds. And while uncoated seed performs well under perfect field conditions, only Apex seed coating provides superior performance under ALL conditions. Apex is available as a Registered Organic Seed Coating.

PILLAR

- ▶ Extremely fast-recovery alfalfa with high yields and quality.
- ▶ Pillar is highly resistant to all major alfalfa diseases.
- ▶ Ideal for a four to five cutting system.
- ▶ Very fast to establish, increasing the stand density.

BARRIER LH

- ▶ Latest in natural leaf-hopper resistance.
- ▶ Barrier is highly resistant to all major alfalfa diseases.
- ▶ High yielding when under leaf-hopper pressure.
- ▶ Adapted to a three or four cut system.

LEADING EDGE

- ▶ Leading Edge is the highest pest- and disease-resistant alfalfa in the Prairie Creek Seed portfolio.
- ▶ Highly resistant to Anphanomyces races one and two.
- ▶ Faster to recover than most standard alfalfa varieties.
- ▶ Ideal for a three, four or five cut system.

UPPER EDGE ML

- ▶ Upper Edge has a very high multi-leaf expression for exceptional quality and yield.
- ▶ Excellent disease package.
- ▶ Responds well to heavy traffic situations.
- ▶ Ideal for a three or four cut system.

HI-GEST 360

- ▶ Improved fiber digestibility and intake for more meat/milk.
- ▶ High-yielding genetics that are non-transgenic.
- ▶ Greater harvest flexibility.
- ▶ No yield drag or reduction in winter hardiness when in a 28- to 35-day cutting schedule.

VALUE

- ▶ Economical blend of winter-hardy alfalfas.
- ▶ Very good yield potential and disease resistance.
- ▶ Recommended for a three or four cut system.

USAGE REFERENCE CHART

	Agronomic characteristics											
	Fall dormancy	Winter survival	Forage yield	Forage quality	Early seeding growth	Early spring growth	Recovery	Traffic tolerance	Root type	Crown depth	Phytophthora root rot	Bacterial wilt
PILLAR	4	1.5	5	5	5	5	5	4.5	Tap	Ave	HR	HR
LEADING EDGE	4.2	1.5	5	4.5	5	5	4.5	4.5	Tap	Ave	HR	HR
BARRIER LH	3.5	2	4.5	4.5	4	4	4	4	Tap	Ave	HR	HR
UPPER EDGE ML	3	2	4	5	4	4	4	4	Tap	Ave	HR	HR
HI-GEST 360	3	1.5	4	5	4	4	4	4	Tap	Ave	HR	HR
VALUE	4	2	4	4	4	4	4	4	Tap	Ave	HR	HR
VEIL CR	2	2	3	4	3.5	3	3.5	5	Creeping	Deep	HR	HR

SCALE 1-5 (1 = POOR, 5 = EXCELLENT)



VEIL CR

- ▶ Veil is a creeping rooted alfalfa with rhizomatous stems.
- ▶ Highly resistant to all major alfalfa diseases.
- ▶ Persistence is major benefit.
- ▶ Adapted to a two cut system or a grazing and pasture environment.



ESTABLISHING ALFALFA

Seedbed preparation. Alfalfa seed is very small at approximately 210,000 seeds/pound. With any seed as small as alfalfa, good soil-to-seed contact for germination and establishment is critical. Most small-seeded forages should be planted at one-quarter inch into a firm, clod-free seedbed with a minimal amount of crop residue, as small seedlings don't have the energy reserves to push out of the soil as well as larger seedlings such as corn.

Alfalfa is normally seeded at 20 to 25 pounds/acre, though rates can vary with soil fertility and management practices. Available equipment for seeding alfalfa can also impact seeding rates. When broadcasting seed, rates should be higher as the seed is spaced farther apart. When drilling, if seed is concentrated into rows closer together, rates can be reduced.

Seeding Checklist

- ▶ Double check previous herbicide applications for carryover concerns.
- ▶ Create a clean clod-free seedbed before planting.
- ▶ Soil should be firm to assist in control of planting depth.
- ▶ Calibrate drill ahead of planting, checking seeding rate and planting depth.
- ▶ Seed at 20 to 25 pounds of alfalfa per acre (may vary).
- ▶ Plant alfalfa seed at approximately one-quarter inch depth.
- ▶ Young seedlings are sensitive to competition and shading.
- ▶ Use an appropriate nurse crop and harvest it in a timely fashion.

- ▶ If no nurse crop is used to establish alfalfa, be prepared to use herbicide for weed control.
- ▶ Once established, harvest the new seeding when appropriate and when conditions are good to prevent damage to the new stand.
- ▶ Allow enough growth in the fall to provide cover and allow alfalfa to build adequate root reserves for winter survival.
- ▶ Both pre-plant and post-establishment fertilizer should be applied for stand establishment and the health of the new seeding.

Disease resistance

Pest Resistance

Verticillium wilt	Fusarium wilt	Anthracnose	Aphanomyces Race 1	Aphanomyces Race 2	Disease rating index	Potato leaf hopper	Stem nematode	N root knot nematode	S root knot nematode	Pea aphid	Spotted alfalfa aphid	Blue alfalfa aphid
HR	HR	HR	HR	NA	34/35	S	NA	HR	NA	R	MR	NA
HR	HR	HR	HR	HR	35/35	S	NA	NA	NA	R	NA	NA
HR	HR	HR	HR	NA	34/35	HR	NA	NA	NA	R	NA	NA
HR	HR	HR	HR	HR	35/35	S	MR	HR	NA	R	NA	NA
HR	HR	HR	HR	HR	35/35	S	R	NA	NA	NA	NA	R
R	HR	HR	R	NA	28/35	S	MR	NA	NA	R	NA	NA
HR	HR	HR	R	NA	33/35	S	NA	NA	NA	NA	NA	NA

NA = NOT AVAILABLE | MR = MODERATE RESISTANCE | R = RESISTANT | HR = HIGHLY RESISTANT | S = SUSCEPTIBLE

CLOVER

DIVERSIFIER LEGUME BLEND

- ▶ Diversifier is a blend of legume species for adding diversity to a pasture.
- ▶ The diversity of the blend benefits the soil biology and will improve the quality of the pasture.
- ▶ Legumes supply nitrogen to the grasses, reducing the amount of supplemental nitrogen that needs to be applied.

Seeding Rate

- ▶ Seeding a new stand: 4 to 6 pounds/acre, along with 15 to 18 pounds/acre of Renovator or a straight grass blend.
- ▶ Seeding with no-till drill: 5 to 8 pounds/acre into existing stands.
- ▶ Frost seeding: 6 to 12 pounds/acre.

Seeding Depth

- ▶ The ideal seeding depth into a firm, clod-free seedbed is one-quarter inch.

FREEDOM! MR RED CLOVER

Freedom! MR is so named because of its freedom from pubescence (non-glandular hairs).

Lack of pubescence promotes faster dry down in the field, reducing the risk of loss of quality.

Freedom! MR is an improved high-yielding red clover supplying much higher yields than common red clovers.

Very adaptable species for uses including pastures, hay and with alfalfa to improve quality.

Seeding Rate

- ▶ Seeding a pure stand: 15 to 20 pounds/acre.
- ▶ Seeding with grass: 8 to 10 pounds/acre.
- ▶ Frost seeding into grass: 10 to 12 pounds/acre.

Seeding Depth

- ▶ The ideal seeding depth into a firm, clod-free seedbed is one-quarter inch.

PCS IRENE WHITE/LADINO CLOVER

- ▶ Irene is an improved white/ladino clover that persists by branching stolons.
- ▶ This clover combines the persistence of a white clover (small leaves) and the yield of a ladino clover (large leaves).
- ▶ Ladino clover is an excellent nitrogen producer.
- ▶ Best suited for pasture applications.

Seeding Rate

- ▶ Seeding a pure stand: 3 to 5 pounds/acre.
- ▶ Seeding with grass: 1 to 3 pounds/acre.
- ▶ Frost seeding into grass: 3 to 6 pounds/acre.

Seeding Depth

- ▶ The ideal seeding depth into a firm, clod-free seedbed is one-quarter inch.

BIRDSFOOT TREFOIL LEGUME

- ▶ Very high-quality and non-bloating legume.
- ▶ Birdsfoot trefoil is a deep-rooted but short-lived perennial.
- ▶ Natural reseeding is needed for persistence. Also requires a longer rest period than other clovers/legumes to lengthen the life of the stand.
- ▶ Best suited for pasture applications.

Seeding Rate

- ▶ Seeding a new stand: 4 to 6 pounds/acre, along with 15 to 18 pounds/acre of Renovator or a straight grass blend.
- ▶ Seeding with no-till drill: 5 to 8 pounds/acre into existing stands.
- ▶ Frost seeding: 6 to 12 pounds/acre.

Seeding Depth

- ▶ The ideal seeding depth into a firm, clod-free seedbed is one-quarter inch.



ALSIKE CLOVER

- ▶ Alsike clover tolerates more acidic soils.
- ▶ Very tolerant of flooding and handles wet soil types.
- ▶ Short-lived perennial that provides very good quality.
- ▶ Best suited for pastures.

Seeding Rate

- ▶ Seeding a pure stand: 3 to 5 pounds/acre.
- ▶ Seeding with grass: 1 to 3 pounds/acre.
- ▶ Frost seeding into grass: 3 to 6 pounds/acre.

Seeding Depth

- ▶ The ideal seeding depth into a firm, clod-free seedbed is one-quarter inch.

OTHER LEGUME/CLOVER SPECIES

- ▶ Crimson clover
- ▶ Balansa clover
- ▶ Berseem clover
- ▶ Vetch
- ▶ Arrowleaf
- ▶ Lespedeza

BETTER FORAGE QUALITY

It has long been recognized that the forage quality of legumes, including clovers, is generally higher than that of most forage grasses. Legumes are usually higher in crude protein, digestibility and many minerals and vitamins. Legume forages are digested more rapidly than grasses. The result is better animal performance.

The total yield of forage per acre from grass/legume mixtures is usually increased over grass alone. For example, studies conducted over many years at the University of Kentucky have shown that red clover grown with tall fescue produces a greater total forage yield than tall fescue fertilized with 180 pounds/acre.

Reduced Animal Toxicities

Clovers can play an important role in offsetting various livestock disorders caused by other forages, especially forage grasses. In a recent survey in two southern states, growing legumes with tall fescue was found to be the number-one strategy used by beef cow and calf producers to cope with the endophyte of tall fescue. Grass tetany is another animal disorder reduced or eliminated by the presence of clovers in animals' diets.

Increased Profitability

The use of clovers in forage crops can have an enormous impact on the economics of pasturing grazing animals. Nutrition is generally recognized as the primary limiting factor on most livestock farms, and legumes usually provide higher nutrition levels than grasses. Better nutrition means more milk production, higher weaning weights and increased likelihood of high reproductive efficiency. These factors positively impact gross income.

Cover forages also help reduce expenses by lowering nitrogen fertilizer expense, typically accounting for 20 to 40 percent of the cost of producing forage from grasses. Clover seed usually costs \$10 to \$25/acre depending on the seeding rate. The value of nitrogen fixed by clovers will, more often than not, offset the cost of their establishment.

The use of clovers in forage programs has dual benefits. When clovers are present, animal performance increases while expenses decrease. Clovers are truly sustainable plants. Research results, farmer experience and many demonstrations have clearly shown clovers to be agronomically sound, environmentally friendly and economically advantageous.

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GRASS: GRASS BLENDS

Prairie Creek Seed has spent the past 20 years working with many different grass species across the United States. Our grasses and grass blends include the very best genetic base available. We know palatability, maturity and digestibility count, and it is our commitment to meet your needs with varieties that offer unparalleled performance and profitability.

RENOVATOR GRAZING

Key Features

Renovator is a multi-species blend of grasses designed to support grass diversity in new or existing pastures. This blend of six different grasses offers varied maturities and growth patterns throughout the course of the growing season. Together with Diversifier, the diversity of plants increases forage quality and yield.

Seeding Rate

Renovator should be seeded at 15 to 18 pounds/acre along with 4 to 6 pounds/acre of Diversifier legume blend. Seeded alone as a straight grass pasture, Renovator should be seeded at 20 to 30 pounds/acre. Inter-seeding into existing grass and legume stands should be 10 to 15 pounds/acre.

Seeding Depth

The ideal seeding depth into a firm, clod-free seedbed is one-quarter inch. When no-till drilling into existing pasture, the seed depth should be one-half inch.

History and Development

Renovator is a six-species blend designed to provide diversity and compatibility to support forage yield and quality across varied soils and management types. We have observed that forage quality and overall plant performance in yield increases in direct proportion to diversity of plant species in the pasture during the growing season.

Management Keys

Renovator is best suited for new pasture establishments and inter-seeding into existing

pastures. This unique blend of grasses is well suited for the Upper Midwest and under irrigation in the Northern Plains and Intermountain West. We recommend planting a legume blend in new establishments to support nitrogen production and the plant health of this mix. Italian ryegrass is a component of the blend that can be used as the nurse crop for establishment if desired.

Characteristics

Tall Fescue	35%
Meadow Fescue	25%
Perennial Ryegrass	20%
Orchardgrass	10%
Timothy	5%
Italian Ryegrass	5%

STOCKMAN BLEND GRAZING

Key Features

Stockman Blend is a mixture designed to handle harsher conditions and withstand continuous grazing pressure. Stockman Blend is a combination of long-lasting perennial grass species and quickly established species to allow for grazing sooner.

Seeding Rate

Stockman Blend should be seeded at 15 to 18 pounds/acre along with 4 to 6 pounds/acre of a legume. Seeded alone as a straight grass pasture, Stockman Blend is recommended to be seeded at 20 to 30 pounds/acre. Inter-seeding into existing grass and legume stands should be 10 to 15 pounds/acre.

Seeding Depth

Ideal seeding depth into a firm, clod-free seedbed is one-quarter inch. When no-till drilling into existing pasture, the seed depth should be one-half inch.

History and Development

Stockman Blend is a blend of five different grass species to provide diversity for soils and conditions that require hardier species. In addition, both annual ryegrass and perennial ryegrass are included to establish fast to cover the soil and allow grazing to resume. Stockman Blend will be best for the producer who sets stocks or in pastures or soils that have tougher conditions.

Management Keys

Stockman Blend is best suited for new pasture establishments and inter-seeding

into existing pastures. This unique blend of grasses is well suited for the Upper Midwest and under irrigation in the Northern Plains and Intermountain West. We recommend planting a legume blend in new establishments to support nitrogen production and the plant health of this mix. Annual ryegrass is a component of the blend that can be used as the nurse crop for establishment if desired.

Characteristics

Tall Fescue	35%
Orchardgrass	25%
Perennial Ryegrass	20%
Annual Ryegrass	15%
Timothy	5%



DIVERSEMASTER GRAZING/BALEAGE

Key Features

Diversemaster is a formulation of grasses and legumes designed to meet the needs of producers that want a very biodiverse pasture. This multiple-species mix contains all of Barenbrug's top grasses including the latest releases of improved grasses such as soft leaf tall fescue, meadow fescue, Orchardgrass and perennial ryegrass. Hakari brome, festulolium, Timothy and Italian ryegrass enhance this blend to give different maturities for a longer period of time, maintaining quality. In addition, Diversemaster includes red clover, white clover, alfalfa and Birdsfoot trefoil. The legume portion allows for a wide variation in rooting types and nutritional qualities.

Seeding Rate

Diversemaster should be seeded at the rate of 20 to 30 pounds/acre into a clean, firm seedbed. When inter-seeding into an existing stand, the rate should be 10 to 15 pounds/acre. It is best to use a no-till drill to inter-seed into established stands.

Seeding Depth

The seeding depth for Diversemaster is one-quarter inch into a firm, clod-free seedbed. When no-till drilling into an established stand, the seed depth should be one-half inch.

History and Development

Diversemaster is designed for a wide range of applications. The more variation a farm has with soil types and fertility levels, the more important it is to have a higher level of diversity. This diversity allows the opportunity for better stand establishment and a more persistent stand life. The variation of plant species is the key to this success. Added diversity also lends itself to better forage quality over an extended period of time.

Management Keys

Diversemaster will need a longer rest and recovery period to assist in persistence of diversity. The quality of forage and diversity of plants will lend itself to grass-finishing beef operations or grass-based dairies on more variable soil types. With the wide range of seed sizes, Diversemaster

is best suited to broadcast seeding, followed by rolling for best soil-to-seed contact. Drilling is not recommended unless the equipment can handle the different seed sizes.

Characteristics

Tall Fescue	12%
Meadow Fescue	10%
Italian Ryegrass	10%
Orchardgrass	4%
Perennial Ryegrass	8%
Hybrid Ryegrass	5%
Timothy	4%
Alaskan Brome	5%
Meadow Brome	5%
Festulolium	4%
Birdsfoot Trefoil	5%
White/Ladino Clover	4%
Red Clover	12%
Alfalfa	8%
Alsike Clover	4%

HAYMASTER DRY HAY/SILAGE/BALEAGE

Key Features

Haymaster is a blend of high-quality grass species that allow dry baling hay during the growing season. Humidity and temperatures make it difficult to produce dry hay in many regions of the United States; however, Haymaster has plant species that are best for achieving this harvest option. Haymaster is also a blend of grasses that will produce quality forage and still maximize tonnage and dry down.

Seeding Rate

Haymaster should be seeded at 3 to 5 pounds/acre as a companion blend for an alfalfa/grass stand. As a pure stand, Haymaster should be seeded at the rate of 15 to 20 pounds/acre.

Seeding Depth

Haymaster should be seeded at one-quarter inch. When no-till drilling, the depth can be increased to one-half inch.

History and Development

Haymaster was developed for producers of high-quality grass hay. Those who desire to market grass hay for its high RFQ value and superior visual appearance should choose Haymaster. The two main components of Haymaster are soft-leaf tall fescue and late-maturing Orchardgrass. The leaf structure of soft-leaf tall fescue blends easily with Orchardgrass and provides the tonnage needed for profitable hay production. Soft-leaf tall fescue varieties are more palatable and digestible than traditional tall fescues. Orchardgrass varieties in Haymaster are disease resistant, making the hay more visually appealing to the buyer. Haymaster is the ideal choice for a producer who desires to make dry hay even in more humid climates.

Management Keys

Haymaster should be placed in a large seed box to reduce the possibility of sorting during planting when seeded with alfalfa for a grass legume mix. The seeding rate will vary with soil fertility and farm management. The higher the levels of free nitrogen in the soil, the lower the suggested seeding rate. Excess nitrogen in the soil solution will be rapidly taken up by the grass seedlings, and they will dominate if the seeding rates are too high. It is best to start with a lower grass rate to find the individual producer's acceptable seeding rate.

Characteristics

Tall Fescue	75%
Orchardgrass	20%
Timothy	5%

GRASS: GRASS BLENDS

ENERGY PLUS SILAGE/BALEAGE/GRAZING

Key Features

Energy Plus is a multi-species blend of grasses designed to support grass diversity in a new or existing pasture. This blend of four different high-energy grasses will be best placed for the production of high-quality silage or baleage. Energy Plus works well for grazing operations that are looking for species that will produce milk or add pounds of beef.

Seeding Rate

Energy Plus should be seeded at 2 to 5 pounds/acre with 16 to 20 pounds/acre of alfalfa when used as a grass introduction into alfalfa. Seeded alone as a straight grass stand, Energy Plus is recommended to be seeded at 20 to 30 pounds/acre. When grazing pasture, 15 to 18 pounds/acre along with 4 to 6 pounds/acre of Diversifier legume blend. Inter-seeding into existing grass and legume stands should be 10 to 15 pounds/acre.

Seeding Depth

The ideal seeding depth into a firm, clod-free seedbed is one-quarter inch. When no-till drilling into existing pasture the seed depth is suggested at one-half inch.

History and Development

Energy Plus is a four-species blend designed to provide high-energy grasses for enhancing dairy or beef diets. All four species are outstanding in providing high NDFd (neutral detergent fiber digestibility) and total dry-matter digestibility. While no single grass can answer all needs for both quality and production, we have introduced the blend to support both.

Management Keys

Energy Plus is best suited for new seeding scenarios and for use as silage, baleage production and managed pastures. With the high-energy

grass included in the blend, production of dry hay is limited and discouraged. This blend needs the best soil for pasture production. If used for grass silage, proper fertilization is required. This unique blend of grasses is well suited for the Upper Midwest and under irrigation in the Northern Plains and Intermountain West. Italian ryegrass is a component of the blend that can be used as the nurse crop for establishment if desired.

Characteristics

Tall Fescue	45%
Meadow Fescue	25%
Perennial Ryegrass	25%
Italian Ryegrass	5%

RANGEMAX GRAZING/BALEAGE

Key Features

RangeMax is a blend of very persistent grasses that, once established, can tolerate a continual grazing system. A mix of early and intermediate maturing species, RangeMax will green up sooner for earlier turnout in the spring. This blend is adapted for many soil types and environments.

Seeding Rate

RangeMax should be seeded at a rate of 15 to 20 pounds/acre. Inter-seeding should be done into an existing stand at 8 to 12 pounds/acre.

Seeding Depth

Seed placement should be one-quarter inch into a well-prepared seedbed or one-half-inch depth in no-till applications.

History and Development

RangeMax was developed for cow/calf producers in areas with variable soils that lend themselves to set stocking pastures. While cow/calf producers benefit most from this blend, RangeMax also is a very durable grass mixture that will tolerate tough field conditions and recover well. The grasses will mature early in the season.

Management Keys

When establishing a new seeding, it would be best to use a cover crop to aid in establishment and reduce weed pressure. RangeMax will respond to fertility but will produce on lower-fertility soils. RangeMax will increase in performance with the rest and recovery of the pastureland but will work well under a set stock situation.

Characteristics

Perennial Ryegrass	25%
Smooth Brome	25%
Orchardgrass	25%
Timothy	25%



MAXIGRAZE GRAZING/BALEAGE

Key Features

MaxiGraze is a blend of grasses and legumes designed to produce very high-quality pasture. This blend of high-energy grasses can tolerate frequent grazing and still persist. Tall fescue has been omitted from the formulation for producers who want to stay away from tall fescue.

Seeding Rate

MaxiGraze should be seeded as a straight stand at the rate of 15 to 25 pounds per acre depending on soils and management. Inter-seed into an existing stand at the rate of 8 to 15 pounds depending on current density.

Seeding Depth

The ideal planting depth would be one-quarter inch when seeding into a tilled field. No-till application depth can be up to one-half inch.

History and Development

MaxiGraze is designed to supply very high-quality forage using a frequent grazing-management style. This blend is meant for more productive soils in the Upper Midwest. The formulation will potentially meet Natural Resources Conservation Service standards for new pastures. Intended for both grass-finishing steers and dairy livestock, quality is very high.

Management Keys

MaxiGraze is ideally suited for high-fertility fields that are moderately to well drained. Soils with a high water-holding capacity and adequate organic matter will lend the best production performance. Included species will lend to many grazing-management styles. This blend can tolerate frequent grazing. Leaving a minimum

of three to four inches of residual growth in the fall will extend the life span of the pasture. A maximum height of six inches of growth during the winter months will also extend the life of the stand and maintain density. MaxiGraze is adapted to the Upper Midwest and under irrigation in the Northern Plains and Intermountain West.

Characteristics

Meadow Fescue	25%
Perennial Ryegrass	24%
Festulolium	20%
Red Clover	12%
White Clover	7%
Ladino Clover	7%
Timothy	5%

WATERWAY MIX GRAZING/EROSION CONTROL

Key Features

Waterway Mix is a multi-species blend of grasses designed to control erosion and allow for harvest of the waterway through mechanical harvest or grazing.

Seeding Rate

Waterway Mix should be seeded at 25 to 30 pounds/acre along with a legume of choice. Seeded alone as straight grass-erosion control, Waterway Mix is recommended to be seeded at 30 to 40 pounds/acre.

Seeding Depth

Ideal seeding depth into a firm, clod-free seedbed is one-quarter inch. When no-till drilling into crop residue the seed depth is suggested at one-half inch.

History and Development

Waterway Mix is a five-species blend designed to provide erosion control and the possibility for hay production. We put together grass species that are sod-forming and will not have the tendency to clump, making it rough to cross the waterways. Annual ryegrass is included to establish quickly while the slower-developing species establish. Prairie Creek Seed includes only varieties that will work for erosion control and livestock feed. We do not put in lesser varieties that could compromise animal health such as Kentucky 21 tall fescue. We have observed that forage quality and overall plant performance in yield increases in direct proportion to diversity of plant species in the pasture during the growing season.

Management Keys

Waterway Mix is best suited for new waterway developments or inter-seeding into existing waterways. Waterway Mix could be used for pastures in environments that are suited for sod-forming species and in tougher traffic areas. This unique blend of grasses is designed for the Upper Midwest and under irrigation in the Northern Plains and Intermountain West. We recommend planting a legume blend in new establishments to support nitrogen production and the plant health of this mix.

Characteristics

Tall Fescue	30%
Smooth Brome	20%
Perennial Ryegrass	18%
Timothy	12%
Annual Ryegrass	15%

GRASS: GRASSES

MILKWAY SILAGE/BALEAGE

Milkway contains high-yielding tall fescue and extremely digestible meadow fescue cultivars, balancing yield and quality.

Ideally suited for haylage applications for ruminant livestock either grown as a single crop or planted with alfalfa.

Seeding Rate

Milkway should be seeded at the rate of 3 to 5 pounds/acre with alfalfa as a companion for an alfalfa/grass production field. Seeded alone as a pure grass stand the seeding rate should be 25 to 30 pounds/acre.

BAROPTIMA PLUS E34 BENEFICIAL ENDOPHYTE TALL FESCUE

Revolutionary tall fescue that improves palatability while eliminating toxicity and increasing animal productivity.

Barenbrug developed a beneficial endophyte that eliminates toxicity but retains the traits of persistence and high yield.

Seeding Rate

- ▶ Seed in spring or fall with a nurse crop.
- ▶ BarOptima PLUS E34 should be seeded at the rate of 25 pounds/acre.
- ▶ It is recommended to seed with a legume for diversity and additional nitrogen production.

STF-43 TALL FESCUE BLEND

STF-43 is an innovative blend of premier soft-leaf tall fescue that produces impressive yields with high levels of digestible fiber.

Late maturing, endophyte-free and well suited for hay and haylage production as well as grazing.

STF-43 is an excellent choice for inter-planting with alfalfa.

Seeding Rate

- ▶ Seed in spring or fall with a nurse crop.
- ▶ Seed at the rate of 3 to 5 pounds/acre with alfalfa.
- ▶ Seed alone at the rate of 25 to 30 pounds/acre.

GREEN SPIRIT ITALIAN RYEGRASS BLEND

Green Spirit is a unique blend of tetraploid Italian ryegrass varieties developed for better persistence under grazing or heavy wheel traffic.

The varieties used in Green Spirit require prolonged periods of cold weather for vernalization. In moderate climates, Green Spirit will be a biannual forage.

Seeding Rate

- ▶ Seed in the spring when conditions are favorable.
- ▶ Seed at the rate of 25 to 30 pounds/acre.

TETRAPRIME TETRAPLOID ITALIAN RYEGRASS

A true Italian ryegrass that will hold quality longer in the season than an annual ryegrass.

Very good winter hardiness and suitable for grazing, baleage and haylage.

Seeding Rate

- ▶ Seed in the spring when conditions are favorable or late summer for a potential spring harvest.
- ▶ Seed at 20 to 30 pounds/acre.

OTHER GRASSES OFFERED

- ▶ Hakari mountain brome
- ▶ Fleet meadow brome
- ▶ Smooth brome
- ▶ Atom brome
- ▶ Perseus festulolium
- ▶ Tetramag hybrid ryegrass
- ▶ Payday perennial ryegrass
- ▶ BG 24T perennial ryegrass
- ▶ Jumbo annual ryegrass
- ▶ Teton II tall fescue
- ▶ HDR meadow fescue blend
- ▶ Lyra orchardgrass
- ▶ Devour orchardgrass
- ▶ HLR orchardgrass blend
- ▶ Barfleo timothy
- ▶ Barderby Kentucky bluegrass



USAGE REFERENCE CHART

	Dry hay	Baleage/silage	Compatible with alfalfa	Extending alfalfa stand	Persistence	Forage quality	High-fertility ground	Low-fertility ground
HAYMASTER	5	4	5	3	5	4	5	5
ENERGY PLUS	2	5	5	4	3	5	5	2
MAXIGRAZE	2	5	4	5	4	4	5	3
DIVERSEMASTER	3	5	1	3	4	5	5	3
RENOVATOR	3	5	3	3	5	4	5	5
RANGEMAX	4	4	5	4	5	3	4	5
STOCKMAN	3	5	1	1	5	3	4	5
WATERWAY MIX	5	5	3	1	5	2	4	5
STF 43	3	5	5	3	4	4	4	4
MILKWAY	2	5	5	3	4	5	5	2
BAROPTIMA PLUS E34	3	5	3	3	5	4	5	4
GREEN SPIRIT	1	5	5	5	2	5	5	1
ATOM	5	5	4	5	1	5	5	2
CRUSADER	1	5	5	5	1	5	5	2
HAKARI	5	5	4	5	2	5	5	1

SCALE 1-5 (1 = POOR, 5 = EXCELLENT)

	Shallow soil	Deep soil	Wet soil	Dry soil	Inter-seeding into pasture	Response to rotational grazing	Response to set stocking	Meat/milk production
HAYMASTER	4	5	3	5	4	4	4	2
ENERGY PLUS	2	5	5	2	4	5	2	5
MAXIGRAZE	4	5	4	3	5	5	4	5
DIVERSEMASTER	5	5	4	5	4	5	2	5
RENOVATOR	4	5	5	5	3	5	4	5
RANGEMAX	4	5	3	5	4	4	5	4
STOCKMAN	4	5	4	5	4	4	5	2
WATERWAY MIX	3	5	5	3	3	4	4	1
STF 43	2	5	5	5	3	5	3	4
MILKWAY	2	5	5	3	1	5	2	5
BAROPTIMA PLUS E34	2	5	5	5	3	5	3	4
GREEN SPIRIT	3	5	5	1	5	5	3	5
ATOM	4	5	2	5	3	5	2	5
CRUSADER	3	5	5	1	5	5	3	5
HAKARI	4	5	1	5	3	5	1	5

SCALE 1-5 (1 = POOR, 5 = EXCELLENT)

COOL-SEASON ANNUAL FORAGES:

COOL-SEASON ANNUALS

Cool season annual forages can be used in many applications for feed or grain. Prairie Creek Seed annuals are designed specifically for forage harvested and fed to livestock. From hooded barley to a forage-specific oat, you can be assured that the yield and quality will achieve the highest level.

In addition to the individual species we maintain in stock, blends of oats/peas and triticale/peas are also available. These blends need to be reserved before February 1 of each planting year.

ANNUAL RYEGRASS: JUMBO

Annual ryegrass establishes quite rapidly, which gives high productivity in the planting season. Annual ryegrass is used mainly as a nurse crop for establishing other forages and will generally not survive winters in northern areas. Jumbo is a late-maturing tetraploid annual ryegrass from Barenbrug. It has good rust resistance and cold tolerance with high yields. Jumbo is suitable for silage as well as grazing.

FORAGE PEA

Forage peas will increase the protein content of cereal crop forages—the primary reason we offer forage pea and cereal crop mixes. Prairie Creek Seed offers Flex pea because of its late flowering (similar to a winter pea), which allows it to match up with the maturity of an oat or triticale in a blend better than any other spring forage pea. In addition, Flex is white-flowering, offering better palatability and digestibility when compared to peas with colored flowers.

FORAGE TRITICALE

Prairie Creek Seed triticale are specific varieties for forage production. They will be awnless or awnleted for palatability if the forage is delayed in harvest. Awns tend to diminish palatability because of the awns' or beards' stiffness and can irritate cattle when consuming the harvested forage. Triticale will mature at about the same time as a mid-season or late oat variety. Dry-matter yield will be close to high-yielding forage oats and fit into an operation with a high level of management. Best harvest timing will result in a very high-quality forage. Triticale works well as a companion forage with forage barley or forage oats.

FORAGE OATS

Forage oats and especially EverLeaf 126 are late maturing and significantly higher yielding than most grain oat varieties. As forages, they are outstanding in both quality and yield. Being later in maturity, EverLeaf 126 can be utilized as either a nurse crop for establishing perennial forages or as a forage crop alone. EverLeaf 126 is a true spring oat with dark green foliage, an erect growth habit and a very good stand. EverLeaf 126 has leaves that extend above the canopy at heading. It is also a delayed heading oat, and much of its forage mass and quality come from its extended maturity. A caution with EverLeaf 126 is that it is susceptible to Barley Yellow Dwarf virus.

GUIDELINES FOR SPRING CEREAL CROP PRODUCTION

Seeding Rate

Optimum seeding rates depend upon species planted, planting date and if the cereal is being used as a companion crop with alfalfa.

- ▶ Oats at 70 to 90 pounds/acre.
- ▶ Barley at 80 to 100 pounds/acre.
- ▶ Triticale at 100 pounds/acre.

Adjustments to these rates need to be made as follows:

- ▶ Seed at the lower end of the range for early planting and the higher end of the range for late planting (after mid-May).
- ▶ If alfalfa is under-seeded, lower the seeding rates by 30 percent to reduce competition with the legume.
- ▶ When using a cereal grain pea blend, the forage seeding rate needs to be increased by 20 percent.

- ▶ Strive for early planting (as soil conditions allow). Late planting for a forage harvest does remain an option; however, yields from late planting will be more dependent on temperature and moisture conditions.

*Excerpts from Focus on Forage
University of Wisconsin Board
of Regents, 2003.*



FORBS

HERBAL BLEND FORB BLEND

Herbal Blend consists of forbs and legumes described as having characteristics that are beneficial to animal nutrition. These fine forbs extract minerals from the soil, if available, at a higher rate than grasses and legumes. They have the ability to scavenge for minerals that are essential to create true proteins for the ruminant animal to utilize. They are highly mineralized and have beneficial compounds for all classes of livestock.

Herbal Blend contains the following forbs and legumes: ribgrass or plantain, chicory, parsley, small burnet, Canadian milkvetch and Cicer milkvetch. Herbal Blend is designed to complement other grass and legume species in your pasture and enhance biodiversity. The

blend may change with the availability and adaptability of the included species.

Perhaps the best time to introduce herbal pasture blends to a farm is in the rotation of pastures. It can be added with the other seed in the drill. This will boost the diversity of your pastures and provide valuable mineral elements for animal health.

Seeding Guide

- ▶ Herbal Blend should be seeded at 3 to 4 pounds/acre with a grass and legume blend to complement a new seeding. The grass and legume blend should be seeded at 20 to 25 pounds/acre rate to achieve a dense pasture stand.

- ▶ Seed 7 to 10 pounds/acre of Herbal Blend with 10 to 15 pounds/acre of a grass and legume mix to achieve a heavier forb component. This is beneficial for isolating livestock to receive the full benefits of a forb paddock. Do not overgraze this pasture, and remove the livestock from the pasture when the average stubble height is 4 inches. After grazing, allow a long recovery period to reestablish the root reserves of the various species.
- ▶ Seed Herbal Blend at the rate of 5 to 7 pounds/acre into an existing pasture. It is best to no-till the seed rather than frost seed. Management is critical to ensure solid stand establishment.

CHICORY

Chicory is classified as a forb. Forbs are non-leguminous broadleaf plants that are rich in minerals and other compounds. They typically are known for the suppression of internal parasites in livestock and other beneficial attributes.

Management for chicory is slightly more intense than for other forbs. This higher level

of management is generally rewarded with the benefits of the plant's natural ability to sequester the nutrients that make chicory a very nutrient-dense forage.

Chicory is fast to establish and can be grazed the first year with economical returns.

Seeding Guide

- ▶ Seed at 1 to 2 pounds/acre in a grass legume pasture mix.
- ▶ Seed 2 to 4 pounds/acre into an existing pasture. It is best to drill into an existing stand.

PLANTAIN

The summer and autumn production of plantain can make a marked difference to the overall dry-matter production of pastures.

Due to plantain's growth into the summer and faster recovery in the fall, the ability to consistently generate extra production is remarkable. This enables extra feed during transitioning seasonal periods.

Plantain has shown real potential as a medium- to long-term pasture option, although it does not provide the reliable longevity of some of the more commonly used grass species.

Plantain is an excellent source of the micronutrients Copper (Cu) and Selenium (Se), making it an excellent choice for pasture grazing.

Drought tolerance and winter productivity in a wide range of environments and soil conditions makes plantain an important consideration with all grasses and legumes. As cool-season forage, plantain can extend pasture quality in hotter regions traditionally dependent on warm-season feed.

Seeding Guide

- ▶ Seed 2 to 3 pounds/acre in a perennial pasture mix.
- ▶ Seed at 4 to 5 pounds/acre in a chicory or clover mix.
- ▶ Seed 3 to 4 pounds/acre with prairie grass.



WARM-SEASON ANNUALS: FORAGE AND GRAIN SORGHUM

As an independent seed company, Prairie Creek Seed is able to access the finest genetics from multiple sources. We select the products we offer on the basis of what is going to perform the best for your operation. As always, yield and agronomics are important; however, digestible nutrients are what pay the bills. We offer warm-season annuals that deliver both yield and quality.

FS 1085 FORAGE SORGHUM

- ▶ The earliest-maturing BMR 6 forage sorghum on the market, at 85 days from emergence to harvest. This will vary with summer temperatures and moisture.
- ▶ Dry-stalk trait will improve ability to direct harvest at the proper stage of development.

FS 1095 FORAGE SORGHUM

- ▶ 95 days to harvest moisture, with the seed head being in the soft dough stage.
- ▶ This BMR forage sorghum will work well in early to mid-season environments.

FS 1105 FORAGE SORGHUM

- ▶ 105-day sterile BMR forage sorghum that will work well for grass operations that desire no grain in the ration.
- ▶ FS 1105 is another BMR forage sorghum for medium- to full-season production areas.

FS 1108 FORAGE SORGHUM

- ▶ This BMR forage sorghum is the latest addition to our portfolio. FS 1108 is a full fertile forage sorghum that offers high starch content.
- ▶ Medium-tall variety that will stand well till harvest. Best suited in a one cut system.

GS 5075R GRAIN SORGHUM

- ▶ GS 5075R is a red grain sorghum with heavy test weight. Yields will be very good in the early maturity group of grain sorghums.
- ▶ At 50 days to 50-percent anthesis, this will be a very early maturing grain sorghum. GS 5075R will move north well with the early maturity or allow more time for cover-crop establishment.

GS 5084W GRAIN SORGHUM

- ▶ GS 5084W is white grain sorghum that will work well for the food-grade market and is high yielding.
- ▶ Medium maturing, this grain sorghum works well for late planting and can tolerate dry weather very well.



VALUE OF FORAGE SORGHUM

Forage sorghum is a viable complement to or replacement for corn silage, especially with the development of earlier varieties for northern climates and higher elevations. Prairie Creek Seed offers forage sorghum varieties from 85 to 108 days (approximate) from emergence to soft dough. At soft dough, the entire plant should be close to harvest moisture and can be harvested standing.

Forage sorghum is designed to replace corn silage under certain environmental and economic conditions, especially in areas with historically low corn silage yields. Forage sorghum will benefit producers most if they can harvest the forage standing, like corn silage, saving time and money by eliminating the swathing process. When forage sorghum is intended to be harvested standing, variety selection is important. Various sorghums are better suited for different geographies and management styles.

Prairie Creek Seed offers varieties that will work in our Upper Midwestern climate, where it's necessary to wait until soils are 60 degrees and warming for planting. If circumstances require, your local PCS team member can advise on other warm-season annuals that may be a better fit. We continue to research improvements and options for the limited season of the northern regions, including our shorter-season forage sorghum and the male sterile varieties.

Advantages of planting forage sorghum for silage:

- ▶ Forage sorghum will generally be higher yielding than corn silage in drier and tougher conditions. In better fields or conditions, corn silage will likely have a 10- to 15-percent yield advantage.
- ▶ Forage sorghum requires 33-percent less water than corn.
- ▶ Forage sorghum seeding rates are quite low—6 to 9 pounds/acre—reducing seed costs.
- ▶ Forage sorghum at soft dough will have low starch but high sugars and NDFd. This gives forage sorghum a high starch equivalent on a forage test closer to corn silage.
- ▶ Forage sorghum is flexible for harvest. It can be cut and wilted for harvest if needs or conditions warrant earlier harvest.
- ▶ Forage sorghum requires less nitrogen than corn. Nitrogen should not exceed 110 pounds actual, including soil-available nitrogen.
- ▶ Energy will increase with heading because of continued sugar formation in the stalks and leaves, plus the carbohydrate deposition in the grain.



WARM-SEASON ANNUALS: SORGHUM SUDANGRASS, MILLET AND TEFF

SS 2010 SORGHUM X SUDANGRASS

- ▶ SS 2010 is a BMR sorghum X sudangrass that has a more traditional growth habit. Leave a 6–8-inch stubble height for faster recovery.
- ▶ Very high yielding with excellent forage quality.

SS 2020 SORGHUM X SUDANGRASS

- ▶ SS 2020 is a Brachytic Dwarf BMR sorghum X sudangrass that has reduced internode length. This allows for a shorter grazing or cutting height and the ability to regrow under these conditions.
- ▶ Reduced internode length gives more leaf and less stem for better standability and higher-quality forage.

SS 2050 SORGHUM X SUDANGRASS

- ▶ SS 2050 is an extraordinarily palatable BMR sorghum X sudangrass that can be grazed or harvested as a forage.
- ▶ The potential grain yields of this exciting sorghum X sudangrass may qualify for 80% LDP where applicable. The early maturity will allow for a silage in areas with limited growing days.

SD 3010 HYBRID SUDANGRASS

- ▶ SD 3010 is a BMR hybrid sudangrass that will be faster to establish and recover than sorghum sudangrass crosses. This makes for more tonnage in a one to two cut system.
- ▶ Fine leaves and stem along with the BMR expression makes for better-quality forage. SD 3010 is our most popular summer forage.

M 5017 BMR MILLET

- ▶ M 5017 BMR Hybrid Pearl Millet is our latest release for summer forages. The BMR trait will enhance not only the quality but the palatability of millet.
- ▶ Fast establishment and quick recovery make millet a high-yielding plant in the northern parts of the Midwest and Intermountain West.
- ▶ There are no prussic acid concerns with millet in the fall with frosts. Reduces fall management stresses.

TEFF

- ▶ Teff is a warm-season annual cereal crop that can be harvested multiple times during the growing season.
- ▶ Higher management is needed for Teff, but it has the ability to dry for hay as an emergency forage. Quality will be very good.

USAGE REFERENCE CHART

	Species	Grazing	Silage/ baleage	Dry hay	Grain production	Speed to establish	Recovery after grazing	Yield in 2–3 cut region	Yield in 3–5 cut region	Palatability	Quality
SD 3010	Hybrid Sudangrass	5	4	2	NA	4	5	5	4	5	5
SS 2050	Hybrid Sudangrass	5	5	3	NA	4	4	4	5	5	5
SS 2020	Sorghum X Sudangrass	5	5	1	NA	2	3	3	5	5	5
SS 2010	Sorghum X Sudangrass	4	5	1	NA	3	4	4	5	4	4
SUUMER BLEND	Annual blend	5	3	1	NA	4	5	4	3	4	5
6010	Teff	4	4	5	NA	4	5	3	4	5	4
M 5017	BMR Millet	5	4	4	NA	5	5	5	3	5	4
FS 1085	Forage Sorghum	3	5	2	NA	3	2	4	3	4	5
FS 1095	Forage Sorghum	3	5	2	NA	3	2	4	3	4	5
FS 1105	Forage Sorghum	4	5	2	NA	3	3	5	5	4	5
FS 1108	Forage Sorghum	3	5	2	4	3	2	5	5	4	5
GS 5075R	Grain Sorghum	3	2	1	5	2	1	2	2	NA	NA
GS 5084W	Grain Sorghum	3	2	1	5	2	1	2	2	NA	NA

SCALE 1–5 (1 = POOR, 5 = EXCELLENT)

COVER CROPS

HELPFUL TIPS



INTER-SEEDING INTO STANDING CORN

Though it's often considered a new idea, early inter-seeding into standing corn has been practiced successfully for many years, as proven by research among major universities and testing on hundreds of plots across the Midwest to the East Coast.

The main reason to inter-seed early is to establish a cover crop while there is adequate moisture and sunlight hitting the soil surface. As the canopy of the corn closes, the cover crop enters a summer dormancy phase, where it maintains but does not continue to grow. During this time, it is not competing with the cash crop for nutrients or moisture.

When the corn crop is physiologically mature or at "black layer," the corn canopy starts to open, allowing light to reach the cover crop so it can begin growing again and capturing unused nutrients, preventing them from leaching away and anchoring them in the soil so they're available for the next cash crop.

Timing is most critical for successful inter-seeding. Ideally, cover crops should be planted into the corn between the V-3 and V-7 stages—the earlier the better if broadcast seeding, planting in narrower rows or aiming to produce more biomass by end of the season.

It is crucial to inter-seed in time to ensure adequate moisture and sunlight to germinate and establish a quality stand. Although broadcast seeding can work, it requires higher seed rates and more time to develop a root system that will allow for survival during full canopy.

COVER CROPS AND HERBICIDE APPLICATION

Herbicide residue is the main factor in establishing a healthy cover crop. Plan ahead when purchasing and applying herbicides on the fields you propose to inter-seed to reduce risk of herbicide carryover that will injure or terminate the establishing cover crop.

Corn hybrid selection. Hybrid type will affect the growing cover crop; not all will be the same. Taller plants with dense canopies will allow little sunlight through the canopy, and this will reduce the success rate of the cover crop. Prairie Creek Seed has observed that annual ryegrass has survived in almost all scenarios; however, too much shade increases the risk of stand loss of other species in the mix. Using a high-flex corn hybrid with a lower plant population can mitigate this shading effect.

THE CORRECT SEED IS CRUCIAL

Prairie Creek Seed performs ongoing research of species and varieties to identify shade tolerance and summer survival and has seen annual ryegrass survive in almost every inter-seeding application. We highly recommend Inter-Seeder Plus, a blend of annual ryegrass, T-Raptor hybrid brassica, crimson clover and balansa clover.

HOW MUCH SHOULD I SPEND ON A COVER CROP?

To answer this common question, first consider your resource concerns. If you know what you are trying to accomplish, we can come up with your best option based on known successes in your area and recommended seeding rates. It is important to remember that many different covers can be planted at different times, and any cover is better than no cover. However, when it comes down to price, you'll get the results you pay for.

COVER CROPS: LEGUMES

Prairie Creek Seed is proud to offer cover-crop blends that will work for all classes of cover croppers, whether you are just getting started or are well seasoned. We also offer premium individual species that will excel in many different environments. If you are looking for service along with seed, our team is second-to-none and would be happy to assist you. Call, text or email anytime.



What are cover crops for, and what do they do?

Soil functions best when it is covered, protected from overexposure to the environment by something growing on its surface. The first and most basic function of a cover crop is to reduce erosion, or the wholesale loss of soil to wind and runoff. Having cover crops in the soil also helps to collect solar energy, turning it into sugars and recycling soil nutrients for use by the next cash crop.

How can we fit cover crops into our rotation?

The key element to remember is that the growing season is much longer than the span between last frost in the spring and first frost in the fall. Many tools are now available to plant cover crops into cash crops before, during or after harvest. Use the resources available and your knowledge of what works on your land. Then don't be afraid to seed outside the box!

For example, cover crops can be inter-seeded into corn both early and late using custom-built inter-seeders, high boys or even aerial application. We have also had success planting into beans when they're starting to yellow to 50-percent, mostly with aerial application. Cover crops succeed consistently following small grains, as well as alfalfa that's terminated early. You might also plant a cool-season annual crop like oats and peas, followed by a cover crop for grazing or forage. Covers may also be drill-planted after corn harvest to establish a cover crop the following spring.

COWPEAS

Cowpeas are the most productive heat-adapted legume used in the U.S. They thrive in hot, moist zones where corn flourishes, but require more heat for optimum growth. Cowpeas protect soil from erosion, smother weeds and produce 100 to 150 pounds of nitrogen/acre. Dense residue helps to improve soil structure.

- ▶ Excellent drought resistance, combined with good tolerance of heat, low fertility requirements and tolerance of a range of soil types, makes cowpeas viable throughout the temperate U.S. wherever summers are warm or hot but frequently dry.
- ▶ Cowpeas make an excellent nitrogen source ahead of cash crops and attract many beneficial insects that prey on pests.

WINTER PEAS

Winter peas produce abundant vining forage, contribute to short-term soil conditioning and generate high rates of nitrogen. Succulent stems break down easily and are a quick source of available nitrogen. Field peas grow rapidly in the cool, moist weather they encounter as winter annuals.

- ▶ Winter peas can produce high quality forages.
- ▶ They are not as winter hardy as other legumes; however, it does help to plant at three to four inches deep to aid in overwintering.
- ▶ Winter peas are top nitrogen producers, yielding from 90 to 150 pounds of nitrogen/acre and at times up to 300 pounds of nitrogen/acre.

CRIMSON CLOVER

With its rapid, robust growth, crimson clover provides early spring nitrogen for full-season crops. Rapid fall growth, or summer growth in cool areas, also makes it a top choice for short-rotation niches as a weed-suppressing green manure.

- ▶ Crimson clover is gaining recognition as a versatile summer-annual cover in colder regions.
- ▶ Crimson clover is gaining popularity as a winter-killed annual, much like oats, in colder zones. Planted in late summer, it provides good ground cover and weed control as it fixes and scavenges nitrogen in and from the soil. Its winter-killed residue is also easy to manage in the spring.



LENTIL

Lentil is a cool season annual. It is generally a short-growing plant reaching eight to 30 inches in height. It is most often utilized in early spring mixtures because of its known ability to withstand weather extremes. The biomass provides some good quality forage, although it can come in limited quantities.

- ▶ Great option for an early season soil builder and green manure crop.
- ▶ Strong seedling vigor allows this species to easily establish, even through thick residue.
- ▶ Good drought and early frost tolerance.
- ▶ Strong nitrogen producer, helps with water infiltration and hosts mycorrhizae.

HAIRY VETCH

Hairy vetch is the leader for spring residue production or nitrogen contribution. Widely adapted and winter hardy through hardiness zone four and into zone three (with snow cover), hairy vetch is a top nitrogen provider in temperate regions. The cover grows slowly in fall, but root development continues throughout the winter. Growth quickens in spring when hairy vetch becomes a sprawling vine up to 12 feet long. Field height rarely exceeds three feet. Its abundant biomass can be both a benefit and a challenge.

- ▶ Hairy vetch smothers spring weeds; however, it can help you replace all or most nitrogen fertilizer needs for late-planted crops.
- ▶ Hairy vetch can improve water infiltration throughout winter by reducing runoff and allowing more water to penetrate the soil profile.

MEDIUM RED CLOVER

Red clover is a dependable, low-cost, readily available workhorse that is winter hardy in much of the U.S. Easily over-seeded or frost-seeded into standing crops, it creates loamy topsoil, adds a moderate amount of nitrogen, helps to suppress weeds and breaks up heavy soil. Its most common uses include forage, grazing and nitrogen production. It's a great legume to frost seed or inter-seed with small grains where you can harvest grain as well as provide weed suppression and manage nitrogen.

- ▶ As a full-season overwintered cover, medium red clover can produce two to four tons of dry matter/acre and fix 70 to 150 pounds of nitrogen/acre.
- ▶ As a rule, red clover grows well wherever corn grows well. It does best in cool conditions.
- ▶ Red clover is an excellent soil conditioner, with an extensive root system that permeates the topsoil. Its taproot may penetrate several feet.

BEST MANAGEMENT PRACTICES

Agriculture is changing rapidly today, and cover crops have a place in every sector. A growing number of producers are “planting green,” with high success rates. To do this, you need a cover crop that has overwintered and is growing in the spring, conditioning the soil for you. You can then plant directly into that cover and use a termination process that fits your farming practice.

SOIL TESTING

Whether you are planting an annual cash crop, forage crop, pasture or even a cover crop, we strongly recommend adequate soil testing. Multiple testing options are available, from conventional soil tests to new soil-health profiles. If you have questions about which test may be right for you, contact your local Prairie Creek Seed dealer. By testing your soil and using recommended additives, you'll greatly increase your production.

CUSTOM BLENDING

At Prairie Creek Seed we are proud of our state-of-the-art seed-blending facility. We now offer custom blending at an affordable rate, so you no longer have to blend your own seed. We can mix anything from a custom cover-crop blend to a custom grass blend. Plan ahead and place your order early so we can make sure your mix is waiting when you are ready for it.

GRAZING LIVESTOCK ON COVER CROPS

Many producers have begun incorporating cover crops to graze livestock, and extensive research proves there are few better ways to enhance soil health or achieve weight gain going into winter. Producers are having excellent success across livestock classes including dry cows, cow/calf pairs, weaning calves, sheep, poultry and even hogs.

When planning a cover crop to graze, remember to diversify your blend to extend the grazing season and allow the varying root depths and structures to condition the soil. Also, optimize the carbon-to-nitrogen ratio to provide a balanced diet for your livestock by including a grass, a legume and a brassica—and oftentimes multiples of each. Finally, be sure to allow for good grazing management so the plants and animals perform best.

COVER CROPS: BRASSICAS



PICK AXE RADISH

► The radish is the most commonly used of the Brassica family. With its powerful taproot, it has the ability to grow deeper than most other plants, allowing it to dig for nutrients, sometimes six feet or more, bringing them back up to the root zone, which makes them available for future cash crops. This deep growth also helps to create root channels for the following

crop that have been proven to increase corn rooting mass at lower depths in the soil. This increase in corn rooting mass and depth increases corn yields.

► Because of its rapid fall growth, Pick Axe accumulates greater fall biomass than most other species – taking up more nitrogen, potassium and sulfur than other cover crops

grown in this time frame. This rapid growth also outcompetes most fall weeds, and these weed-suppressing benefits can last through spring.

► The radish typically needs two to three nights in the teens to winterkill, making it a good option to keep a living root in the ground longer into the fall.

BARKANT TURNIP

► Forages of the Brassica family are very useful for extending the grazing season when other forages are less productive. Brassicas can provide higher crude protein and digestibility at half the cost of hay or conserved forages.

► Brassicas have extremely high yield potential when grown on high fertility soils and carefully managed.

► Cold, drought and heat tolerant, these crops commonly provide valuable feed when other crops are less productive.

► Barkant can be broadcast or drilled with six- to eight-inch rows at 2 to 3 pounds/acre. It is very important not to plant the seed too deep; one-eighth inch will work best.

► Seed at the rate of 1 to 3 pounds/acre with cereal crops for extended grazing.

T-RAPTOR FORAGE BRASSICA

► T-Raptor is an early maturing hybrid brassica, a cross between a forage turnip and a forage rape, and exhibits a leafy growth habit (higher leaf-to-bulb ratio) well suited for grazing.

► T-Raptor can provide higher crude protein and digestibility at half the cost of hay or conserved forages. Brassicas have extremely high yield

potential when grown on high fertility soils and are properly managed. Brassicas can produce as many as 40 tons (wet) per acre.

► Early maturing with a seven- to 10-week crop duration.

► T-Raptor can be broadcast or drilled with six- to eight-inch rows at 3 to 4 pounds/acre. It is

very important not to plant the seed too deep; one-eighth inch will work best. With good management, T-Raptor can be grazed once per month.

► Can be sown in spring or late summer.

USAGE REFERENCE CHART

	Species	Days to dry-matter maturity	Annual/perennial	Companion with annual grasses	Companion with cool-season cereals	Companion with warm-season annuals
PICK AXE	Tankard Turnip	50	Annual	5	5	4
BARKANT	Tankard Turnip	50	Annual	3	5	2
HUNTER	Leaf Turnip	40	Annual	3	5	3
T-RAPTOR	Hybrid Brassica	40	Annual	4	5	4
BARSICA	Rape	60	Annual	4	4	5
WINFRED	Forage Rape	90	Annual	5	3	5
GRAZA	Forage Radish	30	Annual	4	5	5
HERBAL BLEND	Forb Blend	60	Perennial	1	1	1
FORAGE FEAST	Chicory	45 - 60	Perennial	3	1	1
TONIC	Plantain	45 -60	Perennial	5	1	1

SCALE 1–5 (1 = POOR, 5 = EXCELLENT)



BARSICA FORAGE BRASSICA

- ▶ Barsica rapeseed is a fast-maturing single or multi-graze forage crop that can be sown for summer, autumn or winter feed. It has higher protein and dry matter content than turnips.
- ▶ It can be sown from early spring to late summer depending on its use. While typically planted as pure stands, it does work well in cover-crop blends.
- ▶ Seeding rate is 3 to 5 pounds/acre. Drop rate if mixing with others.
- ▶ Excellent multiple grazing forage.

WINFRED FORAGE BRASSICA

- ▶ Winfred forage brassica is a cross between a turnip and kale, generally termed a rape.
- ▶ Early maturing at 10 to 12 weeks.
- ▶ Winfred has good frost tolerance and retains leaf and stem quality in frosty or cold conditions. This feature may extend grazing times from early summer into early winter.
- ▶ Once established, Winfred is tolerant of dry conditions. This product becomes a flexible multifaceted tool ideal for summer, fall and winter feeding.
- ▶ Winfred is supported by an aggressive root system. This makes it an excellent cover-crop option in soil improvement systems incorporating grazing.

HUNTER FORAGE BRASSICA

- ▶ Hunter is a fast-establishing crop, with the first grazing possible at six to eight weeks (45 to 55 days).
- ▶ Selected for vigorous regrowth and fast recovery from grazing, Hunter has the ability to yield in the second, third and sometimes fourth regrowth cycle.
- ▶ Best suited to heavier soil conditions with periodic summer moisture or irrigation where multiple grazing opportunities can be achieved.
- ▶ Hunter is a hybrid developed by crossing turnips with related Asiatic leaf vegetables of the same species. The resulting quick-growing, leafy turnip with minimal bulb development is best suited for multiple grazing passes for summer and early fall feed requirements.
- ▶ When given moisture, Hunter recovers very quickly from repeated grazing for excellent subsequent yields. It is an integral component of “cocktail cover crops.”

GRAZA FORAGE RADISH

- ▶ Graza is a fast-growing, drought-tolerant radish that can be grazed multiple times as it rapidly regrows after grazing.
- ▶ During summer when weight gains are difficult, Graza offers a palatable solution to the effects of cool-season pastures.
- ▶ Graza’s palatability, yield and quality under grazing compares favorably with the typically used leafy turnips.
- ▶ A major advantage of Graza is its persistence, resulting in more grazing cycles.
- ▶ Graza is a cost-effective cultivar to grow, easy to sow and quick to germinate. It also does not need special tillage or planting equipment as it’s easy to drill into stubble.

	Recovery after grazing	Multiple grazing option	Cover crop	Spring planting	Early August planting	Late summer/fall planting
PICK AXE	3	3	5	1	5	5
BARKANT	3	1	5	1	5	3
HUNTER	2	2	5	4	5	5
T-RAPTOR	5	5	5	5	5	4
BARSICA	4	4	5	4	5	3
WINFRED	5	5	5	5	5	2
GRAZA	3	4	5	5	5	5
HERBAL BLEND	5	5	1	5	5	1
FORAGE FEAST	5	5	1	5	5	1
TONIC	5	5	1	5	5	1

SCALE 1–5 (1 = POOR, 5 = EXCELLENT)

COVER CROPS: COVER-CROP BLENDS

FORAGE MAX

New! Forage Max is a blend of oats, barley, lentils, peas, radish, turnip and forage brassica designed to be planted early spring or late summer into fall. Forage Max will winterkill but should handle multiple frosts.

- ▶ For highest feed production, plant in early spring or late July–August.
- ▶ Provides excellent late fall growth without the risk of overwintering.
- ▶ Ideal blend for grazing.
- ▶ Excellent nutrient scavenger with a midrange carbon/nitrogen ration.

COOL SEASON COMBO

New! Cool Season Combo cover-crop blend is specifically designed to capture and hold nutrients in place for your next cash crop along with producing more nutrients. It is a complex mix of winter cereal rye, winter triticale, oats, radishes, barkant turnips, barsica rapeseed, red clover, crimson clover and hairy vetch. With this mix you will see a rapid growth in late summer continuing throughout the fall season and into spring.

- ▶ Potential for fall and spring grazing.
- ▶ Nutrient builder and scavenger.
- ▶ Strong rating for weed suppression.
- ▶ Excellent for increasing diversity.

CHEYENNE

Cheyenne is a blend of radish and forage turnips designed for inter-seeding and is especially good for fall to early winter grazing. It is the most utilized of cover crops in areas that integrate livestock into a cropping plan. Both the forage turnip and radish will sequester many nutrients and provide very high-quality forage to complement corn stalks.

- ▶ This blend is cow-friendly and reduces the choking risk associated with bulb turnips.
- ▶ Quick to establish, it makes more dry-matter tonnage than many other cover crops.
- ▶ Winterkills in most areas so less management is needed in the spring.

NUTRI-SAVER

Nutri-Saver cover-crop blend is specifically designed to capture and hold nutrients in place for your next cash crop. It offers the diversity of annual ryegrass, radishes, barkant turnips and barsica rapeseed. With this mix, you will see rapid growth in late summer that continues throughout the fall season. By extending the growing season of your fields, you are able to capture and store energy from the sun in your soil. This also aids in sequestering carbon.

- ▶ Works great following early harvest soybeans, silage or after canning crop production.
- ▶ Quick to establish cover and offers multiple rooting depths.
- ▶ Winterkills in most areas in the Upper Midwest, but the annual ryegrass does have potential for overwintering.
- ▶ Produced with top-notch cover-crop genetics.
- ▶ Plant late summer to early fall.

INTER-SEEDER PLUS

Inter-Seeder Plus is a diverse mix of annual ryegrass, crimson clover, balansa clover and hybrid brassica. This cover-crop blend was designed to capture excess nutrients in the late summer and early fall after the corn hits black layer. Inter-Seeder Plus has shown excellent shade tolerance and is able to withstand the extreme shade under the corn canopy.

- ▶ Best planted into standing corn between V-4 and V-7.
- ▶ Works best in a shorter corn or less leafy hybrid.
- ▶ An excellent way to capture unused nutrients after corn, preventing leaching.
- ▶ Helps to increase the grazing value of cornstalks.

JACKSON

Jackson is a blend of clover, radish, tankard turnip and leaf turnip. Diversity is the key to building soil structure; the various brassica types will stimulate soil biology with different rooting varieties and nutrient-holding tanks. The clover builds nitrogen and assists in building organic matter. Ideally follow with a corn or grass crop to take advantage of the nitrogen accumulation.

- ▶ Works great for following small grains back into corn.
- ▶ Nutrient scavenging and faster release of nutrients.
- ▶ Great for grazing.
- ▶ Limited winter survival for less effort for spring termination.



NITRO

Nitro is a blend of five different clovers and radish. This blend is formulated to offer diversity and build nitrogen. The radish scavenges free nitrogen and other nutrients in the soil to hold and then release in the spring. The clovers are a mix of winter hardy and active clovers. This allows for clover to build more nitrogen in the spring before termination.

- ▶ As a cover crop that has a high probability of overwintering, termination will be necessary. This “plow down” or sprayed-out cover slowly releases nitrogen back to the next crop.
- ▶ The combination of radish and clover balances nutrient release and works great for a corn or grass crop to follow.

AGRI-VANTAGE

Agri-Vantage is a cover-crop blend that is specifically designed to capture and hold nutrients in place for the next cash crop. It offers diversity through the various species within the mix, such as winter cereal rye, Pick Axe radishes, Barkant turnips and T-Raptor rapeseed. This blend has rapid growth during the late summer that continues throughout the fall season. By extending the growing season in the fields, more energy from the sun can be captured and stored. This also aids in sequestering carbon.

- ▶ An excellent option to follow corn silage.
- ▶ Can provide great fall growth along with rapid spring growth.
- ▶ Potential fall and spring forage options.
- ▶ A great mix to plant the fall before going into soybeans.

SUMMER BLEND

Summer blend is a very diverse blend of warm-season grasses, summer legumes and brassicas. This blend of six-plus species is very diverse, enhancing soil biology and in turn promoting soil health and structure. This blend is best planted late spring to late August. Earlier plantings will improve the grazing season or build a tremendous amount of forage or material to build soil organic matter. All species in the blend are likely to winterkill, so planting after soils warm above 60 degrees until after small grains is important.

- ▶ Developed first for a grazing blend, but has grown as a cover crop.
- ▶ Huge biomass production.
- ▶ Soil health and biology promotion.
- ▶ Excellent grazer.
- ▶ Wind, water erosion and compaction relief.

OATS

Oats are one of the more versatile cover crops as they can be planted at various times of the season and used as an excellent cover and forage crop. Oats work well alone but are even better in mixes. Oats are a cool-season grass that will winterkill in most places. With a deep and fibrous root mass, oats are an excellent scavenger of nitrogen.

WINTER CEREAL RYE

Winter cereal rye is a cool-season grass that germinates in very cool conditions. Winter rye is an excellent option for later planting when other options are no longer viable. An excellent choice to prevent wind and water erosion, spring weed suppression and nutrient capturing, winter rye works well with brassicas and demands a spring termination plan.

CENTURION ANNUAL RYEGRASS

Centurion is an ideal annual ryegrass choice for dairies, beef and hay operations that need a ryegrass that can perform in multiple roles. In addition, it is an excellent choice for cover-crop use. Centurion exhibits excellent winter hardiness and will not linger long into the summer. When fall planted, it will survive the early onslaught of cold, wet weather to provide cover and offer biodiversity following non-grass crops. This diploid annual ryegrass has excellent forage yield and will provide ample amounts of high-quality feed. It also offers improved disease resistance to ensure above-average yield and quality.



Prairie Creek Seed's state-of-the-art blender at our seed-blending facility.

COVER-CROP BLENDS

New name	Basic Components	N Fixation	Nutrient Scavenging	Rate of Nutrient Release	Wind Erosion	Water Erosion
FORAGE MAX	Oats, Spring Barley, Lentile, Peas, Radish, Turnip, Forage Brassica	4	5	3	5	5
NITRO	Radish, Red Clover Crimson Clover, Balansa Clover, Alsike Clover, Berseem Clover	5	5	5	5	4
JACKSON	Crimson Clover, Radish, Hybrid, Turnip	3	5	5	5	4
NUTRI-SAVER	Annual Ryegrass, Turnip, Rapeseed, Radish	0	5	5	5	5
INTER-SEEDER PLUS	Annual Ryegrass, Crimson Clover, Balansa Clover, Hybrid Brassica	3	5	4	5	5
COOL SEASON COMBO	Winter Cereal Rye, Triticale, Oats, Radish, Turnips, Rapeseed, Hairy Vetch, Red Clover, Crimson Clover	4	5	3	5	5
SUMMER BLEND	Sorghum X Sudangrass, Sudangrass, Millet, Cowpeas, Brassica, Berseem	3	4	3	5	5
AGRI-VANTAGE	Winter Cereal Rye, Turnip, Radish, Rapeseed	0	5	3	5	5
CHEYENNE	Radish, Brassica	0	5	4	5	3

INDIVIDUAL SPECIES

Variety	Class	General	N Fixation	Nutrient Scavenging	Rate of Nutrient Release	Wind Erosion	Water Erosion
	Balansa Clover	Legume	4	3	5	3	3
	Berseem Clover	Legume	4	2	5	3	3
	Red Clover	Legume	4	3	5	3	3
	Crimson Clover	Legume	3	3	5	3	3
	Alsike Clover	Legume	4	3	5	3	3
	Birdsfoot Trefoil	Legume	4	2	5	3	3
	Hairy Vetch	Legume	5	3	5	3	3
	Sunn Hemp	Legume	5	2	5	3	3
	Winter Pea	Legume	5	3	5	3	3
	Lentil	Legume	4	2	5	3	3
	Cowpeas	Legume	4	2	5	3	3
	Field Pea	Legume	4	2	5	3	3
PICK AXE	Radish	Brassica	0	5	4	5	3
GRAZA	Forage Radish	Brassica	0	4	3	5	4
	Purple Top Turnip	Brassica	0	4	4	5	3
BARKANT	Tankard Turnip	Brassica	0	4	4	5	4
WINFRED	Rape Seed	Brassica	0	4	3	5	3
BARSICA	Rape Seed	Brassica	0	4	3	5	4
T-RAPTOR	Hybrid Rape X Forage Turnip	Brassica	0	4	3	5	4
	Oat	Cereal	0	5	2	5	4
	Barley	Cereal	0	5	2	5	4
	Triticale	Cereal	0	5	2	5	5
	Cereal Rye	Cereal	0	5	1	5	5
CENTURION	Annual Ryegrass	Grass	0	5	2	4	5
	SorghumXSudangrass	Grass	0	4	1	5	4
M5017	Millet	Grass	0	4	1	5	4
	Annual Ryegrass	Grass	0	5	2	4	5
GREEN SPIRIT	Italian Ryegrass	Grass	0	5	2	4	5
	Sunflower	Broadleaf	0	3	1	3	4
	Buckwheat	Broadleaf	0	3	2	3	4
	Sugar Beet	Broadleaf	0	4	4	4	3

SCALE 1–5 (1 = POOR, 5 = EXCELLENT)

Compaction Allevation		Forage Quality	Winter Survivability	Early Interseeding	Late Interseeding	Aerial Seeding Rate*	Broadcast Seeding Rate*	Drilled Seeding Rate*	Precision Planting
5	4	5	0	No	Yes	40-90#	35-80#	25-45#	NR
5	3	5	3	Yes	Yes	10-12#	8-10#	6-8#	6-8#
5	2	4	1	No	No	10-12#	8-10#	6-8#	NR
5	3	5	1	Yes	Yes	18-22#	17-20#	14-16#	12-14#
5	3	5	1	Yes	Yes	18-22#	17-20#	14-16#	12-14#
5	4	4	5	No	Yes	55-120#	50-110#	35-110#	NR
4	5	5	0	No	No	NR	NR	15-30#	NR
5	4	5	5	No	Yes	55-120#	50-110#	45-110#	40-50#
5	3	4	0	Yes	yes	6-8#	5-7#	4-6#	2-4#

Compaction Allevation	Soil Builder	Forage Quality	Winter Survivability	Early Interseeding	Late Interseeding	Aerial Seeding Rate*	Broadcast Seeding Rate*	Drilled Seeding Rate*	Precision Planting
1	1	4	3	Yes	Yes	8-10#	6-9#	5-8#	4-6#
1	1	5	0	Yes	Yes	NR	15-20#	8-12#	6-9#
1	1	5	4	Yes	Yes	12-15#	10-12#	8-10#	6-8#
2	1	5	2	Yes	Yes	20-25#	20-25#	15-20#	10-15#
1	1	5	4	Yes	Yes	NR	8-9#	7-8#	NR
1	1	5	4	Yes	Yes	NR	8-10#	5-8#	NR
1	1	4	3	Yes	Yes	25-35#	25-35#	15-20#	10-15#
1	1	2	0	No	No	NR	18-20#	15-18#	8-10#
1	1	4	4	No	Incorp	NR	NR	35-45#	22-28#
1	1	3	0	No	No	NR	NR	14-16#	4-6#
1	1	5	0	Yes	No	NR	80-100#	40-60#	30-40#
1	1	4	0	Yes	No	NR	90-100#	50-80#	20-30#
5	5	4	0	Yes	Yes	9-10#	7-8#	5-7#	2-4#
3	5	5	0	No	Yes	11-12#	9-10#	6-8#	3-4#
2	5	4	0	Yes	Yes	8-9#	7-8#	5-7#	NR
4	5	5	0	Yes	Yes	5-6#	4-5#	3-4#	2-3#
4	5	5	1	Yes	Yes	8-9#	6-7#	4-5#	2-3#
4	5	5	0	Yes	Yes	8-9#	6-7#	4-5#	2-3#
4	5	5	0	Yes	Yes	8-9#	6-7#	4-5#	2-3#
2	5	4	0	No	Yes	110-120	90-110	75-85#	50-60#
2	5	5	0	No	Yes	110-120	90-110	75-85#	50-60#
3	5	5	5	No	Yes	75-85	70-75	55-65#	40-45#
3	5	4	5	No	Yes	100-120#	90-100#	60-80#	40-50#
4	4	5	3	Yes	Yes	18-20#	15-17#	11-13#	10-12#
4	5	5	0	No	No	NR	30-35#	35-45	20-22#
3	5	5	0	No	No	NR	25-30#	20-25	14-16#
4	4	4	3	Yes	Yes	30-35#	20-30#	10-20#	8-10#
4	4	5	3	No	Yes	35-45#	25-35#	15-25#	10-12#
3	4	2	0	No	No	NR	NR	8-9#	6-8#
2	3	2	0	No		NR	NR	50-55#	NR
?	4	3	0	No		NR	6-8#	4-6#	3-4#

*Heavier rates are recommended for forage and highly erodable soil.
NR = Not Recommended



 **Prairie Creek Seed**

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