



farm science

genetics®

www.farmsciencegenetics.com

a better way to grow®



PRODUCT GUIDE



Who we are . . .



farm science

genetics®

Farm Science Genetics is dedicated to providing agronomically and nutritionally superior forage varieties that fit into a wide range of management situations and withstand the most challenging growing conditions. Through careful breeding, in-depth research and quality-controlled production, Farm Science Genetics offers the latest seed innovations to maximize profitability on the farms of forage producers across North America.

a better way to grow®

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ALFALFA

(*Medicago sativa* L.)



Uses

Crops: Alfalfa is harvested as hay or silage which is processed or fed directly to livestock. Alfalfa is an important source of leaf meal used for fortifying baby food and other special diet foods prepared for human use. Large quantities of dehydrated alfalfa are also used in manufacturing concentrated feeds for poultry and livestock.

Livestock: This plant is grown by itself or in combination with grasses in improved pastures. It is grazed by all types of domestic livestock. Caution should be taken when using alfalfa for grazing due to its potential bloat hazard.

Wildlife: Alfalfa is an excellent food for antelope, deer, elk, Canada geese, sage grouse and sharp tail grouse. It is fair food for sandhill cranes, mallards, Hungarian partridge and pheasants.

Description

Alfalfa is a long-lived perennial legume. Flowers vary in color from purple to yellow and are borne in loose clusters. Pods of alfalfa range from the sickle type to those that are twisted into spirals. Each pod contains several small kidney-shaped seeds. Alfalfa is indeterminate and stems can reach several feet in length. New growth occurs from buds in the crown. The plant has a tap root which may penetrate 25 feet deep into the soil. Compound leaves are alternately arranged on the stem and are normally trifoliate although there are commercial varieties that have multifoliate leaves. There are approximately 227,000 seeds/pound.

Adaptation and Distribution

Alfalfa grows best on deep, well-drained, friable soils. Lands subject to frequent overflows or high water tables are unfavorable for alfalfa. The pH of the soil should be 6.5 to 7.5. Alfalfa is distributed throughout the United States and Canada.

Establishment

A seedbed should be smooth, firm, free of weeds and trash, and contain adequate moisture for germination and emergence. Land grading should be sufficient to ensure good surface drainage. Alfalfa should not be seeded as a first crop on newly leveled land where fill may settle and cause poor surface drainage.

Alfalfa seeded at 15 to 20 pounds of coated or non-coated inoculated seed per acre evenly drilled 1/4-inch deep on adapted, properly prepared sites will produce adequate stands. A combination drill and packer is desirable. Cultipacking soil before and after seeding is helpful to stand establishment. Seeding depth should be no greater than 1/4 inch on finer textured soils and no greater than 1/2 inch on sandy soils. Spring seedings can be made 30 days before the average date of the last killing frost. Alfalfa can also be successfully seeded during the late summer. Allow time for adequate growth prior to the first killing frost.

Management

In general, graze or cut for hay when alfalfa is in early bloom. Graze or cut to about a 2-inch height. Subsequent cuttings for hay should occur when fields start to bloom. Alfalfa can best withstand grazing if rotated frequently or grazed in small strips. The last cutting of alfalfa should be made 3 to 4 weeks before the first killing frost date. Alfalfa may cause livestock to bloat. Care should be used in managing such grazing to reduce the possibility of this hazard.



ALFALFA

Farm Science Genetics Alfalfa Agronomics Chart

Variety	229CR	329	408DP	415BR	421LH	423ST	426	431RRLH	438RR	440HVXRR	527
Bacterial Wilt	HR	HR	HR	HR							
Fusarium Wilt	HR	HR	HR	HR							
Verticillium Wilt	HR	HR	R	HR	HR	HR	HR	HR	HR	HR	HR
Anthraco nose	HR	HR	HR	HR	HR	R	HR	HR	HR	HR	HR
Phytophthora Root Rot	HR	HR	HR	HR							
Aphanomyces Race 1	R	HR	R	HR	HR	R	HR	HR	HR	HR	HR
Aphanomyces Race 2	NR	NR	NR	R	HR	NR	HR	NR	HR	NR	R
Pea Aphid	MR	R	R	NR	R	R	HR	R	HR	NR	HR
Spotted Alfalfa Aphid	NR	NR	NR	NR	NR	NR	MR	NR	NR	NR	R
Blue Alfalfa Aphid	NR	NR	NR	NR							
Stem Nematode	R	HR	R	HR	MR	R	NR	MR	R	NR	R
Northern Root Knot Nematode	HR	HR	HR	HR	NR	HR	NR	NR	NR	NR	NR
Potato Leafhopper	S	S	S	S	HR	S	S	HR	S	S	S
Total DRI	29/35	30/35	28/35	34/35	35/35	28/35	35/35	30/35	35/35	30/35	34/35
Fall Dormancy	2.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0
Winter Survival	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Multifoliate	No	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes

Fall Dormancy Ratings: 1=Most Dormant, 11=Least Dormant. This is an indicator of relative maturity.

Winter Survival Ratings: 1=Most Hardy, 6=Least Hardy.

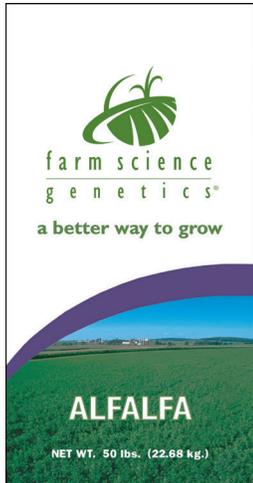
Disease Ratings: HR=Highly Resistant, R=Resistant, MR=Moderately Resistant, LR=Low Resistance, S=Susceptible, NR=No Rating

Salt Tolerance: G=Germination, F=Forage

FSG 229CR ALFALFA ▼

- **Highly persistent Creeping Rooted alfalfa**
- **Excellent drought and wet soil tolerance**
- **Multi purpose – great for haying or pasturing**
- **Tough and widely adapted alfalfa**

FSG 229CR alfalfa is a highly persistent creeping alfalfa specialized for utilization in both pastures and hay production under dryland and irrigated conditions. As the alfalfa stand matures, new crowns develop from buds on the roots which increase stand density. FSG 229CR also expresses a branch rooted trait that increases survivability in wet soil conditions.



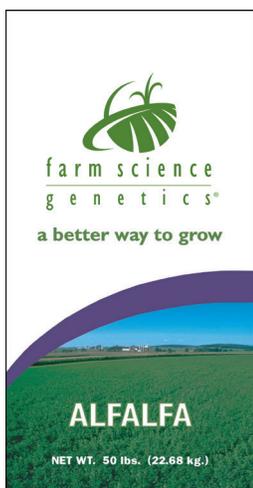
Characteristics

Fall Dormancy 2.0
Winter Survival 2.0 (Very Good)
Root Type Branch
Recovery After Cutting..... Fast

FSG 329 ALFALFA ▼

- **Highly persistent multifoliate variety**
- **Excellent forage yield potential and quality**
- **High resistance to stem and northern root-knot nematodes**
- **Perfect 30/30 DRI rating**
- **Widely adapted**

FSG 329 alfalfa was selected for yield, persistence, nematode resistance and disease resistance so that it will produce even under adverse environmental pressures. FSG 329 is adapted throughout the Western, North Central and Eastern United States. Forage quality is enhanced due to FSG 329's high multifoliate expression and is a great choice for commercial hay, beef and dairy producers.

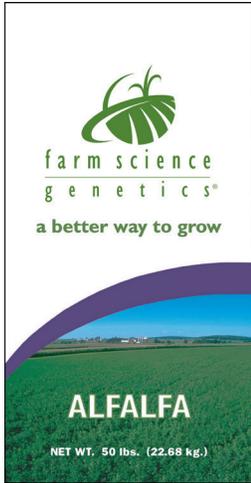


Characteristics

Fall Dormancy 3.0
Winter Survival 2.0 (Very Good)
Root Type Tap
Recovery After Cutting..... Fast



FSG 408DP ALFALFA ▾



- **Dual purpose alfalfa - hay or graze**
- **Wide, deep-set crowns**
- **Stands up to wheel traffic pressure**
- **High yield potential**
- **Superior winterhardiness and persistence**

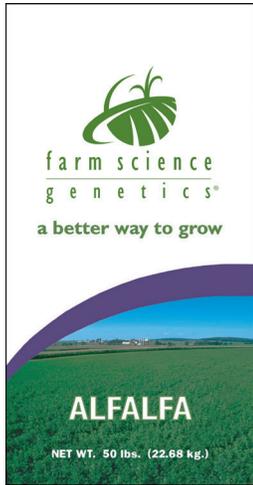
FSG 408DP Alfalfa has been bred for deep set crowns with 61% of the crowns 1 inch to 1 1/2 inches below the soil surface. The deep set crown trait helps insulate the crown in severe winter weather and protect the crown from animal and equipment traffic. This versatile variety is ideal for three to four cut management systems where wheel traffic is a concern or for intensive livestock grazing year after year. With high hay yields, great forage quality and an excellent disease and insect resistance package, FSG 408DP gives you the flexibility to optimize your management decisions.

Characteristics

Fall Dormancy..... 4.0
Winter Survival..... 2.0 (Very Good)
Root Type Tap
Recovery After Cutting Very Fast



FSG 415BR ALFALFA ▾



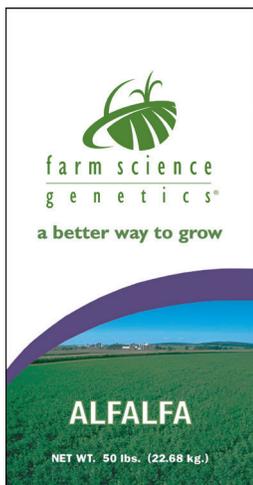
- **Aphanomyces Race 2 resistance**
- **Branch root type**
- **Adapted to variable soil conditions**
- **Stands up to wheel traffic pressure**
- **High yield and quality potential**
- **Excellent winterhardiness and persistence**

FSG 415BR alfalfa with Aphanomyces Race 2 resistance excels on both poor and well drained soils, plus resists heaving and mechanical injury due to its branch root structure. A superior disease and insect resistance package, including high resistance to the major alfalfa nematode species, ensures wide adaptability from the Northeast to the Intermountain West. With high yield and forage quality potential, especially under less than ideal soil conditions, FSG 415BR gives you the flexibility to optimize your management decisions.

Characteristics

Fall Dormancy 4.0
Winter Survival..... 2.0 (Very Good)
Root Type..... Branch
Recovery After Cutting.....Very Fast

FSG 421LH ALFALFA ▾



- **Very high resistance to Potato Leafhoppers**
- **High resistance to Aphanomyces Race 2**
- **Superior yield potential**
- **Excellent forage quality with increased palatability**
- **Glandular haired conventional alfalfa**
- **Widely adapted**

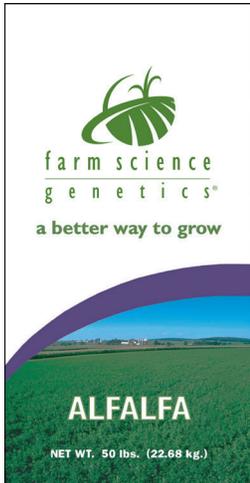
FSG 421LH alfalfa is Farm Science Genetics latest conventional potato leafhopper resistant variety. With very high leafhopper resistance, a Wisconsin disease index rating of 35/35 and a fall dormancy of 4, FSG 421LH is at the top when it comes to performance, adaptability and pest resistance. FSG 421LH tolerates a wide range of environmental and soil conditions with characteristics such as high resistance to Aphanomyces Race 2, excellent persistence, fast recovery after cutting and high relative feed quality in sprayed or unsprayed conditions. FSG 421LH is the perfect choice for areas where potato leafhoppers cause economic damage year after year.

Characteristics

Fall Dormancy 4.0
Winter Survival..... 2.0 (Very Good)
Root Type..... Tap
Recovery After Cutting.....Very Fast



FSG 423ST ALFALFA ▾



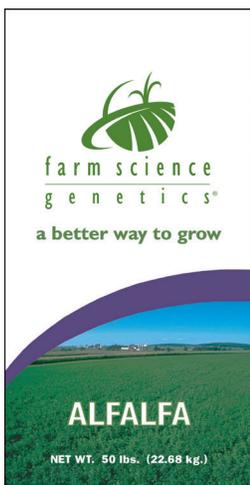
- **Higher forage production under saline soil conditions**
- **Fine stemmed with superior forage quality**
- **Excellent persistence and winterhardiness**
- **Resistance to stem and northern root knot nematodes**
- **Widely adapted**

FSG 423ST alfalfa was selected for persistence and high forage yield from parent plants growing in the saline soils of the northern Great Plains. Due to its tolerance to saline soils, branching/tap root system and great disease resistance package, FSG 423ST produces high quality, fine stemmed hay and tolerates variable soil types. FSG 423ST is adapted to the Great Plains, North Central Region and the winterhardy Intermountain Region of the United States. Not just for saline soil conditions, FSG 423ST alfalfa is an excellent choice for any area where a high yielding, superior forage quality alfalfa variety is desired.

Characteristics

- Fall Dormancy 4.0**
- Winter Survival..... 2.0 (Very Good)**
- Saline Soils Tolerant**
- Root Type Tap and Branch**
- Recovery After Cutting.....Fast**

FSG 426 ALFALFA ▾



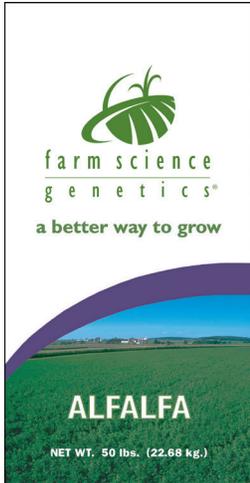
- **Highly resistant to Aphanomyces Race 2**
- **Exceptional forage yield potential**
- **Superior forage quality**
- **High multifoliate leaf expression**
- **Unmatched winterhardiness and persistence**
- **Perfect 35 out of 35 on the Wisconsin Disease Rating Index**

FSG 426 alfalfa is the leader in alfalfa performance with an outstanding trait package that raises the agronomic achievement bar to the next level. FSG 426 performs well over a wide range of environmental conditions and is adapted to all areas where 3 and 4 fall dormancy varieties are planted. FSG 426 features high resistance to Aphanomyces Race 2, scoring a Wisconsin disease index rating of 35/35. Whether it's for exceptional forage yields, superior forage quality or very fast recovery after cutting, FSG 426 is the first choice for commercial hay, beef and dairy producers.

Characteristics

- Fall Dormancy..... 4.0**
- Winter Survival..... 2.0 (Very Good)**
- Root Type Tap**
- Recovery After Cutting Very Fast**

FSG 431RRLH ALFALFA ▼



- **Highly resistant to Potato Leafhoppers**
- **Roundup Ready® Alfalfa**
- **Great forage yield potential**
- **Superior forage quality**
- **High multifoliate leaf expression**
- **Excellent winterhardiness and persistence**
- **30/30 Wisconsin DRI rating**

431RRLH is the latest generation of Roundup Ready® Alfalfa leafhopper resistant varieties that lets you produce cleaner, higher quality alfalfa for greater profit potential. The simplicity and improved crop safety of using one herbicide along with high leafhopper resistance enables you to be in control instead of Mother Nature. 431RRLH alfalfa performs well over a wide range of environmental conditions and is adapted to all areas where 3, 4 and 5 fall dormancy varieties are planted. Whether it's for great forage yields, superior forage quality or fast recovery after cutting, 431RRLH alfalfa is the choice for commercial hay, beef and dairy producers who want to take advantage of Roundup Ready® Alfalfa technology in areas where potato leafhoppers are a significant economic problem.



Characteristics

Fall Dormancy	4.0
Winter Survival	2.0 (Very Good)
Root Type	Tap
Recovery After Cutting.....	Very Fast

Roundup Ready® Alfalfa

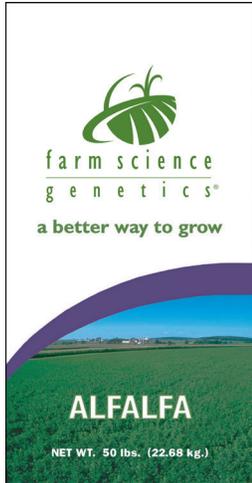
Due to the unique cropping practices do not plant Roundup Ready® Alfalfa in Imperial County, California, pending import approvals and until Forage Genetics International, LLC (FGI) grants express permission for such planting.

Roundup Ready® Alfalfa has pending import approvals. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Growers should talk to their grain handler or product purchaser to confirm their buying position for this product.

Visit www.ForageGenetics.com/legal-statements for the full legal, stewardship and trademark statements for these products.



FSG 438RR ALFALFA



- **Roundup Ready® Alfalfa**
- **High resistance to Aphanomyces Race 2**
- **Unsurpassed weed control**
- **Great forage yield potential**
- **Superior forage quality**
- **High multifoliate leaf expression**
- **Excellent winterhardiness and persistence**

438RR alfalfa lets you produce cleaner, higher quality alfalfa for greater profit potential. The simplicity and improved crop safety of using one herbicide with the widest window of application available enables you to be in control instead of Mother Nature. 438RR alfalfa performs well over a wide range of environmental conditions and is adapted to all areas where 3, 4 and 5 fall dormancy varieties are planted. With high resistance to Aphanomyces Race 2, 438RR alfalfa features a Wisconsin disease index rating of 35/35 and is also resistant to stem nematodes. Whether it's for great forage yields, superior forage quality or very fast recovery after cutting, 438RR is the choice for commercial hay, beef and dairy producers who want to take advantage of Roundup Ready® Alfalfa technology.



Characteristics

- Fall Dormancy 4.0**
- Winter Survival 2.0 (Very Good)**
- Root Type Tap**
- Recovery After Cutting..... Very Fast**

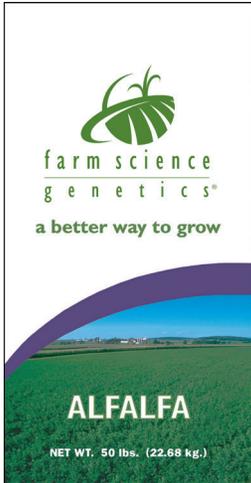
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FSG 440HVXRR ALFALFA



- **440HVXRR Alfalfa gives growers the ability to better manage the yield-versus-quality tradeoff. It offers more flexibility in a cutting schedule to achieve improved forage quality or greater yield potential, when compared to conventional alfalfa at the same stage of maturity.**
- **The HarvXtra™ technology provides unprecedented flexibility by extending cutting windows, which gives growers the option at each cutting to:**
 - Maintain their normal harvest schedules for higher-quality forage, or
 - Delay harvest for 7-10 days for increased yield potential, without sacrificing forage quality compared to conventional alfalfa at the same stage of maturity.
- **440HVXRR Alfalfa has on average 12-15% less lignin and 12-15% higher neutral detergent fiber digestibility (NDFD) and relative forage quality (RFQ) than conventional alfalfa harvested at the same stage of maturity.**
- **V440HVXRR Alfalfa is stacked with Roundup Ready® Technology for unsurpassed weed control with excellent crop safety.**

440HVXRR Alfalfa is the industry's first genetically enhanced alfalfa technology developed to maximize quality compared to conventional alfalfa at the same stage of maturity, by reducing the amount of lignin in the plant.

Characteristics

Fall Dormancy	4.0
Winter Survival	2.0 (Very Good)
Root Type	Tap
Recovery After Cutting.....	Very Fast



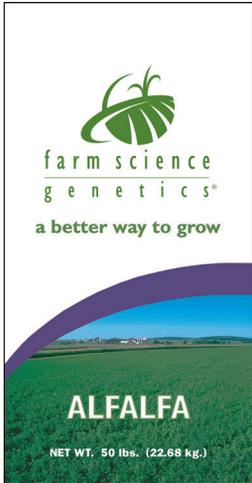
This product is available for planting in a limited geography and growers must direct and product produced from HarvXtra Alfalfa with Roundup Ready Technology seed or crops (including hay and hay products) only to US domestic use. It is a violation of national and international law to move material containing biotech traits across boundaries into nationas where import is not permitted. Growers should talk to their product purchaser to confirm their buying position for this product.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Roundup Ready® crops contain genes that confer tolerance to glyphosate. Glyhosate agricultural herbicides will kill crops that are not tolerant to glyphosate Roundup®, and Roundup Ready® are registered trademarks of Monsanto Technology LLC. HarvXtra™ is a trakemark of Forage Genetics International, LLC. HarvXtra™ Alfalfa with Roundup Ready® Technology is enabled with Technology from The Samuel Roberts Noble Foundation, Inc.

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FSG 527 ALFALFA ▾



- **High forage yield potential**
- **Superb forage quality**
- **High multifoliate leaf expression**
- **Very fast recovery after cutting**
- **Excellent winterhardiness and stand persistence**
- **Superior disease and pest resistance**

FSG 527 alfalfa with its superior combination of high forage yield potential, very fast recovery after cutting, superb forage quality and stand persistence is ideal for commercial hay growers or dairy producers using an intensive cutting management schedule for areas with longer growing seasons. FSG 527 is adapted to all areas where fall dormancy 4 and 5 alfalfa varieties are planted.

Characteristics

- Fall Dormancy 5.0**
- Winter Survival 2.0 (Very Good)**
- Root Type Tap**
- Recovery After Cutting Very Fast**





RED CLOVER

(Trifolium pratense L.)



Uses

Red clover is used for hay, silage, pasture and soil improvement. It is a quick growing crop, easily established, and produces high quality forage. Tolerance of shade allows red clover to be used effectively as a cover crop under silage corn. Newer varieties of medium red clover can be productive for 3 years or more under proper management.

Description

Red clover, is a short-lived perennial that grows as one of two types: medium (double-cut) or mammoth (single-cut). Red clover plants grow from crowns. Plants have hollow, hairy stems and branches. Stem lengths of medium and mammoth types average 18 inches and 24 to 30 inches, respectively. Medium types have about 4 branches per stem; mammoth have 6. Each leaf consists of a slender stalk bearing 3 leaflets. The taproot of red clover is extensively branched. Flowers are borne in compact clusters or heads and are usually rose-pink in color. Seed pods are small, short, and contain kidney-shaped seeds that vary in color from yellow to deep violet. There are approximately 272,000 seeds per pound. Mammoth red clover matures later than medium types; only one crop of mammoth red clover is harvested each season since recovery is slow.

Adaptation and Distribution

Red clover grows best on well-drained loamy soils, but it will also grow on soil that is not well-drained. Medium and fine textured soils are preferred by the plant over sandy or gravelly soils. It is best adapted to a pH of 6.0 or higher. Red clover is distributed throughout the United States and Canada.

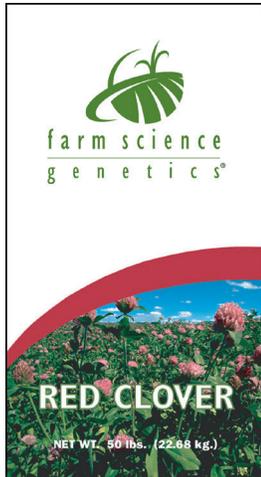
Establishment

Red clover may be seeded in pure stands, but it is often mixed with grain or grass. Spring or late summer seedings are satisfactory. It may be overseeded in the spring or fall. Red clover seed should be inoculated. Phosphorus and potash are the fertilizer elements needed most by red clover. Apply as recommended by soil tests. Seeding may be done with a drill or broadcaster. A firm, weed-free seedbed is essential. Plant seeds 1/4 to 1/2 inch deep. Seeding rates are 12 to 15 lbs./acre broadcast and 6 to 8 lbs./acre when drilled. For renovating pastures, the recommended seeding rate is 8 lbs./acre.

Management

Graze or cut for hay when the red clover is 1/4 to 1/2 bloom. A second cutting or successive grazings should occur when red clover is 1/4 in bloom. Leave at least 2 to 3 inches of growth after each harvest. Care should be taken to eliminate or appreciably reduce bloating of livestock when grazing. Keep lime and fertilizers (phosphorus and potash) at the proper level.

FSG 402 RED CLOVER



- **High yield potential**
- **Excellent forage quality**
- **Longer stand persistence**
- **Superior disease resistance**

FSG 402 is an elite, new generation, diploid medium red clover developed for higher yields and longer stand persistence; three or more years under proper management. FSG 402 reaches 50% bloom at approximately the same time as Arlington and Kenland, and 4 days earlier than Marathon in the spring and performs extremely well over a wide geographic area under variable growing conditions. FSG 402 is highly resistant to northern anthracnose, southern anthracnose and powdery mildew while showing an improved level of field resistance to black patch (*Rhizoctonia*) compared to Arlington, Marathon, Kenland and Freedom. Whether it's for pastures, silage or hay, FSG 402 can't be beat when it comes to yield, quality, stand persistence and disease resistance.

PERFORMANCE DATA - FORAGE YIELD / DISEASE RESISTANCE

Entry	North		South		Total		Black Patch
	L/Y	%Mean	L/Y	%Mean	L/Y	%Mean	
FSG 402	10	105	5	101	15	104	3.7
Arlington		79		88		81	8.1
Marathon		93		92		93	5.7
Kenland		94		101		96	6.0
Kenway		100		97		99	4.2
FSG 402	4	105	4	99	8	103	4.5
Freedom		102		101		102	5.7

Disease rating: 9 > 90% infected plants; 1 < 10% infected plants; visual rating





WHITE CLOVER

(*Trifolium repens* L.)



Uses

Forage: White clover is the most important pasture legume. It is a highly palatable, nutritious forage for all classes of livestock. White clover is commonly planted with orchardgrass, ryegrass, or tall fescue. Ladino clover grows tall enough to be harvested for hay, silage and green chop. Intermediate and small white clovers seldom grow tall enough to be harvested for hay or silage.

Wildlife: White clover is a choice food for deer and elk.

Erosion control: Grass seedings benefit from the nitrogen produced by white clover included in the seed mixture. Solid stands of white clover form a good erosion controlling cover on moist fertile soils, but stands may be sparse or spotty on dry sites.

Description

White clover, is a perennial legume that originated in Europe and has become one of the most widely distributed legumes in the world. It has a prostrate, stoloniferous growth habit. The leaves are composed of three leaflets, which may or may not have a “crescent” or “water mark” on the upper surface. Leaves and roots develop along the stolon at the nodes.

The three general types of white clover usually recognized are (1) large or ladino, (2) intermediate, and (3) small. The flower heads, each consisting of 40 to 100 florets, are borne on long stalks from the leaf axils. Florets are white but may have a pink hue. There are approximately 768,000 seeds per pound.

Adaptation and Distribution

White clover thrives best in a cool, moist climate on soils with ample lime, phosphate and potash. In general, white clover is best adapted to clay and silt soils in humid and irrigated areas. It grows successfully on sandy soils with a high water table or irrigated droughty soils when adequately fertilized. White clover seldom roots deeper than 2 feet, which makes it adapted to shallow soils when adequate moisture is available.

Establishment

The standard seeding rate is 2 to 4 pounds per acre, planted at a depth of 1/4 to 1/2 inch. For pasture establishment, seeds are drilled into a well-prepared seedbed that has been plowed, harrowed and compacted to produce a firm seedbed. The seeds are inoculated before seeding. For stabilization use, seeds are broadcast on roadside cuts and fills by cyclone seeders, hydroseeders or blower-type equipment. The proper time of seeding is determined by seasonal and moisture conditions. This may vary from April to May. Late summer and fall seedings should be conducted while adequate moisture is still in the soil to assure establishment before freezing.

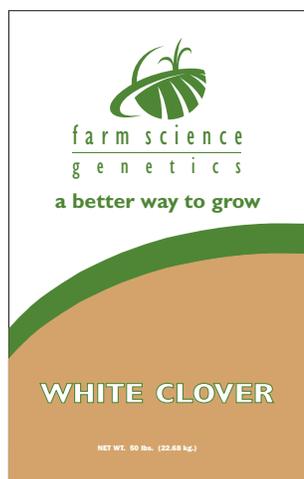
Management

Management for forage is aimed at maintaining 40% to 50% clover. Close grazing (2 inch stubble height) favors clover, whereas light grazing favors grass. Well-fertilized grass will outgrow clover in fall and winter and could smother the clover. Spring applications of nitrogen will stimulate grass and provide early feed, but excessive rates are detrimental to the clover stand. Phosphate applications are broadcast in fall or spring according to soil tests. Sulfur, boron or magnesium may be needed for maximum production on some soils in the western part of white clover's range.

CRUSADE WHITE CLOVER▼

- Improved winter growth
- Extended grazing potential during colder months
- Superior growth
- Early and vigorous flowering
- Disease resistant

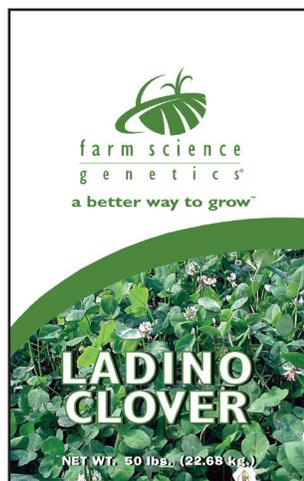
Crusade white clover is the result of a breeding program that has taken the best traits of the traditional Haifa variety and combined them with improved winter activity qualities. Therefore, it can introduce added benefits in plant productivity and health to temperate regions where winter-active white clovers are desired. To develop this variety, selections were made from plants displaying superior growth in winter, autumn and spring. Other traits selected in the development of Crusade were dark green leaves, early and vigorous flowering, and high seed yield. A strong emphasis was also placed on freedom from virus and disease symptoms, and strong recovery from cutting, grazing and moisture stress. Crusade is a vigorous, winter-active variety of white clover. Leaflets are similar in appearance to Haifa, but can have a darker green appearance with fewer leaf markings. Crusade is slightly earlier in flowering than regular Haifa. Because of its winter-active characteristic, Crusade will provide grazing during the colder months in regions experiencing mild, moist winter conditions.



PINNACLE LADINO CLOVER▼

- Resistant to leaf diseases and field viruses
- High forage yields
- Ideal for pastures
- Superior persistence
- Excellent seedling vigor
- Aggressive stolon activity
- Drought tolerant
- Widely adapted

Pinnacle is an exceptional ladino clover variety developed for today's high performance pasture needs. Look for excellent establishment and seedling vigor along with cool season productivity and the aggressive season long growth necessary to maximize grazing. Pinnacle has a very upright growth habit with numerous fine stems and large dark green leaves. This variety was bred for superior persistence and can stand up to leaf disease and virus pressure. Pinnacle is adapted throughout the United States and Canada, wherever ladino clovers are grown.





BIRDSFOOT TREFOIL

(Lotus corniculatus L.)



Uses

Forage: Birdsfoot trefoil is used as a high quality, non-bloating legume for pastures, hay and stock-piling.

Erosion control: Birdsfoot trefoil is often used for mine reclamation and other sites with marginal soils.

Wildlife: Birdsfoot trefoil is used in wildlife mixes and is an excellent food source for deer.

Description

Birdsfoot trefoil is a short-lived, non-bloating perennial legume which has the ability to reseed itself under proper management. Stems are smaller in diameter and less rigid than alfalfa stems and can grow to a height of 12 to 30 inches depending on whether it is a prostrate or erect variety. Flowers are bright yellow (4 to 8 per stem) with each flower producing one seed pod. Seed pods radiate from the flower stalk, resembling a bird's foot. Leaves are compound with five oval leaflets. Birdsfoot trefoil has a well developed tap root with numerous lateral branches in the upper 15 inches of soil. There are approximately 370,000 seeds per pound.

Adaptation and Distribution

Birdsfoot trefoil is found from the south central United States to southern Canada. It is most productive in fertile, well drained soils with a close to neutral pH. However, birdsfoot trefoil can be grown on low pH (5.5) soils with low fertility and will tolerate short periods of flooding better than alfalfa. It can tolerate periods of drought and is more suited to soils prone to heaving. Alfalfa will out produce birdsfoot trefoil by 50 to 80 percent on well drained, fertile soils limiting birdsfoot trefoil to areas where alfalfa is difficult to produce.

Establishment

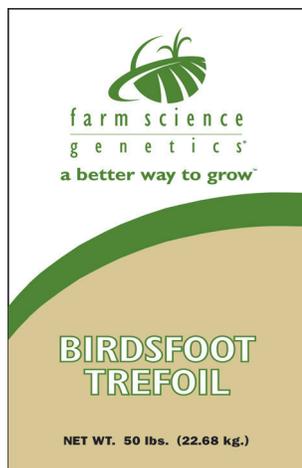
Birdsfoot trefoil should be inoculated before planting to ensure sufficient nodulation of the root system for nitrogen fixation. A smooth, firm seedbed is recommended. Seeding depth should not be more than 1/4 inch. The seeding rate is 8 to 10 pounds per acre for pure stands and 2 to 8 pounds per acre in mixes, depending on the cool season grasses utilized. Early spring seeding is generally more successful than late summer seeding.

Management

When harvested for hay, the first cutting should be taken at 1/10 bloom with a second cutting in mid to late August. To maintain a stand of birdsfoot trefoil, it is necessary to use a management system that provides sufficient regrowth between cuttings and allows the plant to reseed itself. Heavy grazing may be needed in the spring to reduce growth but close, continuous grazing is not recommended because summer regrowth depends on energy supplied by top growth not root reserves like alfalfa. Leave 3 to 4 inches of top growth when grazing. Avoid haying or grazing between September 1st and the first killing frost to allow root reserves to accumulate for better winter survival and spring growth.

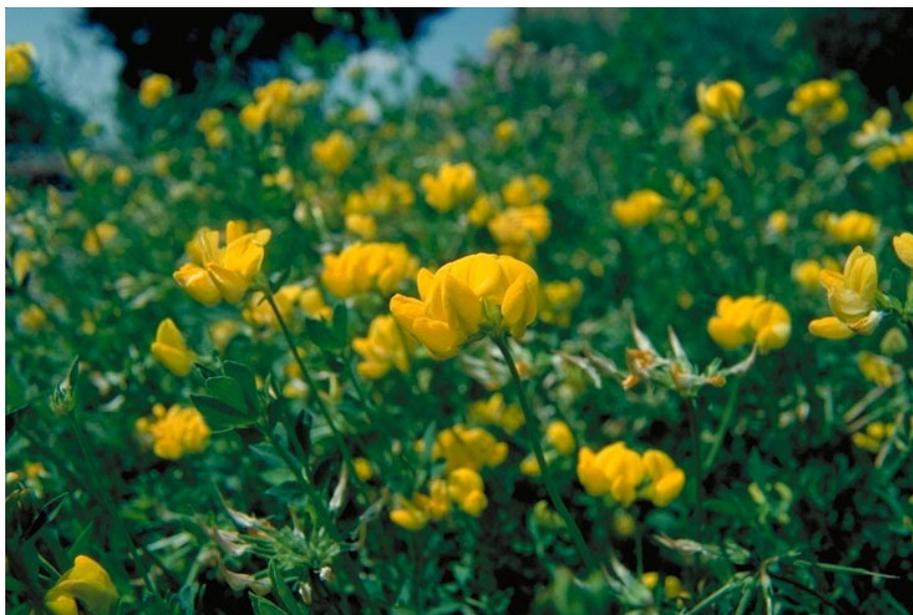
Birdsfoot trefoil is well suited for stockpiling since it maintains its leaves at maturity and after frosts. Birdsfoot trefoil responds to proper fertility management which should be determined by soil testing.

PARDEE BIRDSFOOT TREFOIL ▾



- **Vastly improved winter survival over other trefoil varieties**
- **Heaving tolerant**
- **High level of Fusarium wilt resistance**
- **Upright growth habit**
- **Earlier flowering than Norcen**
- **Fast recovery after cutting**
- **Higher yield over life of stand than other varieties**
- **Developed by Cornell University**
- **Performs on poorly drained soils**

Widely adapted with proven performance, Pardee birdsfoot trefoil was developed by the Cornell University Agricultural Experiment Station in Ithaca, NY. This upright, hay-type variety has an earlier maturity than both Norcen and Viking. Pardee was derived from a mixture of trefoil varieties and plant introductions. This genetic material was selected for vigor and resistance to Fusarium wilt. The result is a forage with greater disease resistance, better stand persistence and higher yields. Pardee can be used on poorly drained soils but will perform well on good soils, too. It has vastly improved winter survival over other trefoil varieties and recovers quickly after cutting. All of these characteristics contribute to higher yields over the life of the stand when compared to other varieties. In 1999 yield trails in New York, Pardee was the highest yielding variety in the first production year, was 37% more resistant to Fusarium wilt than unselected experimental varieties and 17% more resistant than Norcen and had the greatest number of plants per square foot in the first production year.





ORCHARDGRASS

(*Dactylis glomerata* L.)



Uses

Livestock: Orchardgrass may be used for hay, pasture or silage. It is highly palatable to all classes of livestock. Orchardgrass is one of the best forage grasses for use in pastures and in combination with alfalfa or red clover for hay.

Erosion control: Because of its dense network of roots, orchardgrass provides good erosion control on those soils to which it is particularly adapted.

Wildlife: Orchardgrass is used in grass-legume mixes for nesting, brood rearing, escape and winter cover for upland game birds and conservation plantings.

Description

Orchardgrass is a persistent, cool season bunchgrass. Under dryland conditions, it usually develops distinct clumps and flower culms 15 to 18 inches tall. Leaves are usually less than 12 inches in height. When grown under irrigation or in more moist situations, it attains a height of 24 to 28 inches. No vegetative spread has been observed.

Orchardgrass is one of the earliest species to grow in the spring, making tremendous growth during cool conditions. Due to deep roots, it also is capable of strong summer growth when conditions are favorable. Orchardgrass has 416,000 seeds per pound.

Adaptation and Distribution

Orchardgrass is found from Canada to the Gulf coast states and from the Atlantic coast to the Pacific coast. However, orchardgrass is not as winter hardy as smooth brome or timothy.

Orchardgrass performs well on different textured soils ranging from clay to gravely loams and on shallow to deep soils. It does not grow well in saline soils and areas with high water tables. It has the ability to establish and persist in areas that receive as little as 11 inches of annual precipitation.

Orchardgrass performs best in a pH range of 5.8 to 7.0.

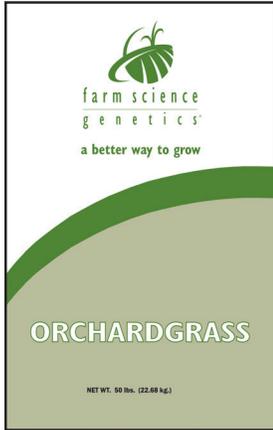
Establishment

A clean, firm, weed-free seedbed is recommended. Range and erosion control seedings should be made in the late fall or very early spring. Do not seed after the spring moisture period is well advanced or a failure may occur because of drought and hot summer conditions before the grass is well established. A deep furrow or range drill with press wheels may be used. Orchardgrass is easily established with grain drills or by broadcast seeding. The seeding rate is 8 to 12 pounds per acre. For range and critical area treatment, a seeding rate of 3 to 4 pounds per acre is recommended. If broadcast, double the seeding rate. Adjustments in seeding rate should be made when seeding in mixtures. Seeding depth should not be more than 1/2 inch.

Management

Under irrigation and higher rainfall areas, orchardgrass should be cut at boot stage for the first cutting and then at 4 to 6 week intervals depending on regrowth. Rotational grazing is best for production, persistence and quality. Fields should be grazed heavily and frequently during the spring, but do not overgraze. Leave a 4 to 5 inch stubble so plants can recover quickly. Heavy grazing during the late fall should be avoided to prevent depletion of root reserves. Under dryland conditions, orchardgrass should not be grazed until late summer or fall of the second growing season. The plants may be severely damaged by overgrazing especially in the seedling year. Use no more than 60% of the annual growth during the winter season or 50% during the growing season. This plant responds well to rotational grazing systems. Orchardgrass responds to good fertility management. One strategy, to even out the forage production, is to fertilize the stand after the first and second cutting or grazing to boost late spring and summer production. Apply fertilizer based upon soil tests.

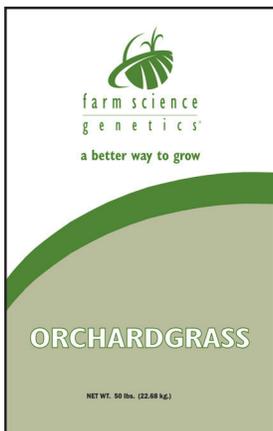
BOUNTY II ORCHARDGRASS



- **Early-Medium Maturity**
- **Superior foliar disease resistance**
- **Great forage yield potential**
- **Excellent stand persistence**
- **Improved seedling vigor**
- **Quick recovery**
- **Dark green color**

Bounty II is an early-medium maturing orchardgrass that is an excellent choice for hay, pasture and silage. This variety was selected for improved seedling vigor, high yield potential and excellent foliar disease resistance. Bounty II is ideal for planting straight or in mixes with other grasses and legumes.

FSG 506OG ORCHARDGRASS

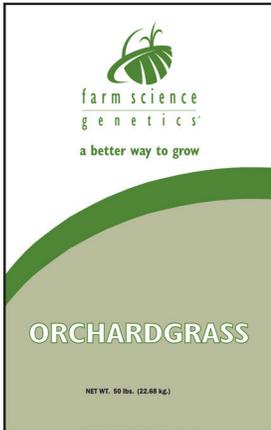


- **Early-Medium Maturity**
- **Selected for seedling vigor**
- **Excellent foliar disease resistance**
- **Quick recovery**
- **Great forage yield potential**
- **Dark green color**
- **Improved stand persistence**

FSG 506OG is an early-medium maturing orchardgrass that is an excellent choice for hay, silage and pasture. This variety was selected for its improved seedling vigor, high yield potential and excellent disease resistance. FSG 506OG is ideal for planting as a straight product or in mixes with other grasses and legumes.



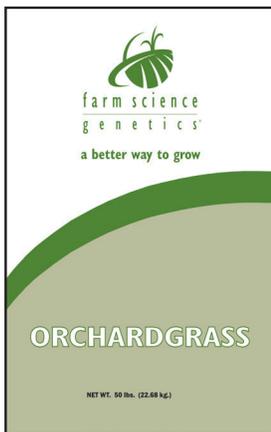
PAWNEE ORCHARDGRASS



- **Excellent drought tolerance**
- **High grazing tolerance**
- **Stem Rust resistant**
- **Great forage yield potential**
- **Widely adapted**

Pawnee orchardgrass is a medium maturing variety developed for drought and grazing tolerance along with increased stem rust resistance and forage yield potential. This variety has a unique background, being selected from plants near Touchet, Washington, that survived five years of continuous grazing by horses, sheep and goats without fertilizer or irrigation. Pawnee is widely adapted, from the semi-arid west and plains to the midwest, northeast and south. In the west, Pawnee is superior to Paiute in forage yield under limited and full irrigation, while similar to Paiute in stand persistence. Whether used for grazing or forage, this workhorse variety has the adaptability and proven performance desired by farmers and ranchers.

EXTEND ORCHARDGRASS



- **Superior yield**
- **Late maturity**
- **Stem Rust resistance**
- **Great palatability**
- **Perfect for alfalfa or clover mixes**
- **Increased stand persistence**
- **Excellent plant vigor**
- **Responds to irrigation**

Extend is ideal for the grower looking for a late maturing orchardgrass to use in a pure stand or in grass-legume mixes. Extend's performance is unrivaled for yield, forage quality, palatability, persistence and drought tolerance.

This superior performance combined with excellent plant vigor and stem rust resistance, makes Extend #1 in the field.

TALL FESCUE

(*Festuca arundinacea*, Schreb.)



Uses

For decades, KY31 tall fescue was planted widely as a forage and erosion control plant because it is widely adapted, easy to establish and long lived under harsh conditions and mistreatment. It is now recognized that the presence of a toxic endophyte contributed to both the tough nature of KY31 and the poor performance of grazing animals in the warmer months. It is suspected that endophyte infected KY31 has been deleterious to wildlife as well.

Today, there are many varieties of tall fescue that are low endophyte or endophyte free, which can be used for hay or pastures without any of the animal health concerns posed by endophyte infected KY31. Tall fescue testing services are available to have existing stands of this grass evaluated for endophyte presence.

Description

Tall fescue is a robust long-lived, comparatively deep rooted, bunchgrass. The broad flat leaves are smooth and shiny on the underside, with pronounced ribs on the upper surface. The stems are 3 to 4 feet tall, supporting a nodding panicle that is 4 to 12 inches long. There are approximately 227,000 seeds per pound.

Adaptation and Distribution

Tall fescue is adapted to cool and humid climates and most soils with a pH of 5.5 to 7.0. Tall fescue will grow fairly well on soils low in fertility, but it is better adapted to fertile conditions. Tall fescue will produce top growth when soils are as cold as 40° F, and it continues growth into late fall in the South.

Establishment

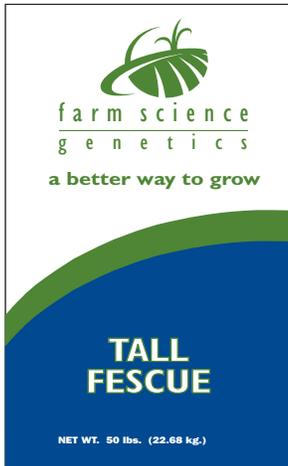
Tall fescue is easy to establish due to its rapid germination and good seedling vigor. It may be planted by any common method such as grass seeders, hydroseeding and broadcasting. Seeding rates are 15 to 20 pounds per acre if drilled and 20 to 25 pounds per acre if broadcast. The seeding depth is 1/2 inch.

Management

While tall fescue is tolerant of abuse and low fertility, it does respond to fertilizer inputs. Follow the soil test recommendations. Endophyte-infected tall fescue will tolerate grazing abuse better than most cool season grasses. If the tall fescue is an endophyte-free variety, it should not be grazed closer than 3 inches, and will not tolerate overgrazing. Tall fescue can be grown with white clover, red clover and alfalfa. First cutting for hay should be at the late boot stage with further cuttings as regrowth allows. Tall fescue is one of the best grasses for stockpiling in the fall.



FSG 402TF TALL FESCUE ▾



- **High yielding, endophyte free**
- **Superior summer regrowth**
- **High grazing preference due to sugar content**
- **Great for winter stockpiling**
- **Excellent persistence and drought tolerance**
- **Wide area of adaptation**

FSG 402TF is an endophyte free, medium maturing tall fescue variety which eliminates concerns about fescue foot, bovine fat necrosis and fescue toxicosis in cattle.

Two characteristics make FSG 402TF stand apart from other tall fescues; summer regrowth and disease resistance. Summer regrowth exceeds that of KY-31, Fawn and Max Q when averaged over all trial locations. This indicates better forage distribution throughout the growing season, reducing the summer slump that cool season grasses normally experience. Stem and Crown Rust data from FFR trials indicate FSG 402TF has significantly higher resistance to both diseases when compared to other commercial and experimental varieties.

With excellent summer regrowth, superior disease resistance, high forage yield potential and a wide area of adaptation, FSG 402TF will easily outperform other currently available tall fescue varieties.



FESTULOLIUM

(*Festulolium braunii*, K.A.)

Uses

Festulolium is a hybrid cross between the Festuca and Lolium species. The agronomic benefits of festulolium started to gain acceptance in the late 1950's with demand steadily increasing over the years. Festulolium is mainly utilized in pastures for grazing and stockpiling, either in mixes or pure stands. Silage and green chop are other major uses. Benefits include higher forage yields than perennial ryegrass, forage quality similar to perennial ryegrass, increased mid summer growth compared to other cool season grasses, high disease resistance, winterhardiness and persistence.

Description

Festulolium is a perennial bunchgrass which has the combined traits of the Festuca and Lolium species. The expression of these traits varies by variety. There are approximately 227,000 seeds per pound.

Adaptation and Distribution

Festulolium is adapted to cool humid climates

as well as less humid climates with supplemental irrigation. Festulolium does well on fertile soils with a pH of 5.5 to 7.0 but is not recommended for poorly drained soils or soils with poor fertility.

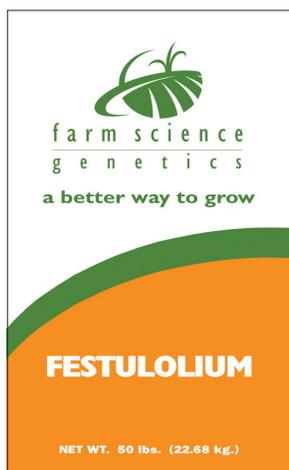
Establishment

Festulolium is easy to establish due to its rapid germination and seedling vigor. Seeding rates are 25 to 45 pounds per acre if seeded alone and 8 to 20 pounds if used in mixtures. Seeding depth is 1/4 inch.

Management

In general, 150 pounds of nitrogen per acre per year will be adequate to maintain a good stand of festulolium. The rule of thumb is to apply 1/3 of the nitrogen in the spring with the balance evenly applied after each harvest or grazing period. Festulolium performs best under a rotational grazing system and should be grazed down to 3 to 4 inches when plants reach a height of 10 to 12 inches. For silage or green chop, festulolium needs to be cut before seed heads emerge for optimum forage quality.

GAIN FESTULOLIUM



- Very high yielding
- Fast germination and establishment
- Vigorous regrowth
- Palatable and nutritious
- Minimizes summer slump

Gain is a vigorous, high yielding festulolium (meadow fescue x Italian ryegrass) which is ideally suited for silage and pasture production from the Pacific Northwest to the Atlantic Northeast states. Gain has a leafy growth habit producing forage that is highly palatable and digestible. Gain is a great choice when you need a fast-starting, high forage quality grass for silage or pasture, either mixed with legumes or as a pure stand.

Pure stand seeding rates are from 25 to 45 lbs. per acre. Seeding rates in mixtures are from 8 to 20 lbs. per acre. A seeding rate of 5 to 7 lbs. per acre may be used as a companion crop for establishing alfalfa, reed canarygrass or other slower starting species to provide faster ground cover plus additional quality forage during the first year or two after seeding. Festuloliums are best adapted to soils with high organic matter content and moisture levels. Forage yields are responsive to nitrogen fertility rates.



TIMOTHY

(*Phleum pratense* L.)



Uses

Livestock: Timothy is used mainly for hay, but also for pasture and silage. It is palatable and nutritious. It makes an excellent companion grass for alfalfa, trefoil or clover since it does not compete with legumes.

Erosion control: Timothy can be used with legumes and/or other grasses in a mix for cover purposes, filter strips, waterways and other critical area applications.

Wildlife: Timothy is commonly found in wildlife mixtures for nesting, brood cover and escape.

Description

Timothy is a relatively short-lived, cool-season perennial that grows in stools or clumps and has a shallow, compact and fibrous root system. It grows in erect clumps 20 to 40 inches tall. Leaves vary in length from a few inches to a foot and are about 1/4 inch wide, narrowing gently toward the tip. Heads are spike-like and dense, from 2 to 6 inches in length. Seed is very small and usually remains enclosed in the glumes. There are approximately 1,152,000 seeds per pound. Timothy is different from most other grasses in that 1 or occasionally 2 of the basal internodes of the stem swell into a bulblike growth. This characteristic is often used for identification of the plant during the early stages of growth.

Adaptation and Distribution

Timothy is adapted to a cool and humid climate. Timothy thrives best on rich, moist bottom lands and on finer textured soils, such as clay loams. It does not do well on coarser soils. It prefers a pH of 5.5 to 7.0. Timothy will grow for a time on soils low in fertility, but it is better adapted to a high fertility soil. It is not well adapted to wet, flat land where water stands for any considerable time. Under limited moisture conditions, it makes a poor recovery and does not tolerate drought or prolonged high temperatures. Timothy is very winter hardy and has high tolerance to cold temperatures and ice encasement.

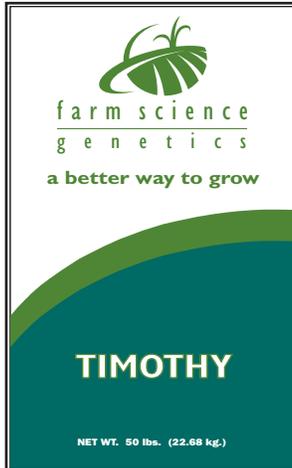
Establishment

Timothy is usually seeded in mixtures with legumes. This mixture may be drilled with a small grain drill. If planted with a winter grain, the timothy is seeded with it, and the legume is planted early the following spring. Seeding depth of timothy should be 1/2 inch. A firm, weed-free seedbed is a key to a successful planting. Common seeding rates are 8 to 10 pounds per acre when seeded alone and 4 to 6 pounds per acre when seeded in mixtures.

Management

Timothy is highly responsive to fertilizers, which should be applied frequently in ample quantities. Fertilizer, especially nitrogen, is important when legumes have almost disappeared from the hay or pasture mixture. Timothy stands become weak under close and continuous grazing. A fundamental reason for the decline of timothy under poor grazing practices is injury to the corms. These corms form in the spring at the same time the stem elongates. Food materials are stored in them, and they may be destroyed by trampling of grazing animals. Timothy can be initially grazed before jointing and again between early head to full head. Second and successive grazing should also occur before jointing and when basal sprouts appear at the soil surface. After the second grazing, plants usually do not joint. Timothy should be cut for hay or silage from early to full head. Make successive harvests for hay and silage when basal sprouts appear at the soil surface. Sterile seed heads may be 15 to 20 inches up the stems when sprouts appear at the time of second cutting. Growing points stay below ground after a second cutting. Graze or cut to a minimum height of 3 inches or more.

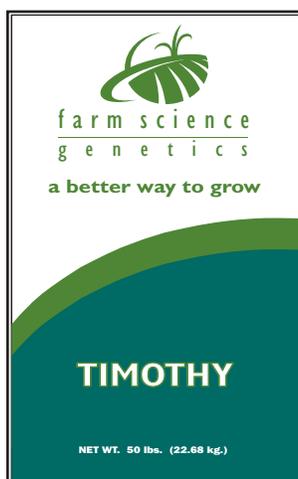
CONQUEST TIMOTHY



- **Early maturity**
- **High forage yield potential**
- **Great forage quality**
- **Perfect for pure stands or with legumes and other grasses**
- **Improved summer regrowth**
- **Excellent spring vigor**
- **Very winterhardy**

Conquest is an early maturing timothy variety, reaching 50% head emergence at approximately the same time as Clair and Summit and two weeks earlier than Climax. Conquest is similar in plant height and panicle length to Clair and Summit and is taller in plant height than Climax. Summit was bred for higher forage yields, greater foliar disease resistance, faster spring green up and improved summer regrowth. Conquest is ideally suited for pasture mixes, especially when used with alfalfa and can tolerate moderate continuous grazing, but does best under rotational grazing. Conquest is the hay and pasture grass of choice for horse and other livestock owners who demand high quality forage.

EXPRESS II TIMOTHY



- **Late maturity**
- **High forage yield potential**
- **Excellent forage quality**
- **Dark green color**
- **Selected for excellent spring vigor and plant health**
- **Strong summer re-growth after cutting**
- **Very winterhardy**
- **Longer harvest window**

Express II is a late maturing timothy variety with a heading date approximately one week later than Climax and a substantial yield advantage. Express II is taller in plant height and has a longer panicle than Climax along with superior foliar disease resistance. Express II is excellent in mixtures with legumes and for fields where later hay harvests are required due to wet soil conditions. In pure stands, Express II's high forage yield and quality makes it ideal for premium horse and other livestock hay.



ANNUAL RYEGRASS

(Lolium perenne spp. multiflorum (Lam.) Husnot)



Uses

Annual ryegrass is primarily used for pastures and quick cover in erosion control plantings. In the South, it is used as a winter annual for overseeding warm season grasses.

Description

Annual ryegrass is quite similar to perennial ryegrass except it is an annual or biennial, depending on climate and/or length or growing season. It may grow a little taller than perennial ryegrass, from 2 to 3 feet tall. Annual ryegrass is a bunchgrass, with numerous long, narrow, stiff leaves near the base of the plant. The under surfaces of leaves are bright, glossy and smooth. Inflorescence stems are nearly naked. There are approximately 227,000 seeds per pound.

Adaptation

These grasses have a wide range of adaptability to soils, but thrive best on fertile soils with a pH between 5.5 and 6.5. They produce well in regions having mild climates. They do not withstand hot, dry weather or severe winters. They will stand fairly wet soils with reasonably good surface drainage. Annual ryegrass is distributed throughout the entire United States.

Establishment

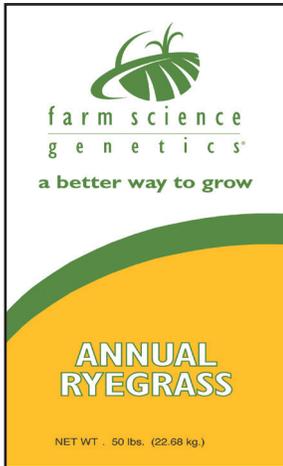
Seed should be planted 1/4 to 1/2 inch deep in a well prepared seedbed. Spring seedings of ryegrass may occur in March, April or May. Annual ryegrass may also be seeded mid-August to early November, depending on the location. Generally, a rate of 20 to 25 pounds per acre is used if ryegrass is seeded alone. In mixtures, 4 to 8 pounds per acre is recommended, depending upon uses and companion species. In general, the annual ryegrass component of a mix should be 20% or less since it is very competitive, due to rapid germination and good seedling vigor.

Management

Ryegrass is generally cut for hay when seed heads start to emerge. Annual ryegrass-clover pastures should be rotationally grazed when spring growth is 3 to 6 inches high. Allowing 7 to 10 inches of regrowth between grazings will benefit yield and persistence. On new seedings, harvest or grazing should be delayed until plants are 10 to 12 inches tall. Ryegrass responds well to good management, such as intensive rotational grazing and fertilizer applications.



FRIA ANNUAL RYEGRASS ▾



- **Superior cold tolerance**
- **High forage yield**
- **Excellent for overseeding**
- **Ideal cover crop**
- **Great disease resistance**
- **Excellent palatability**

Fria annual ryegrass not only delivers outstanding yields in the south and north, but has exceptional cold tolerance that helps in fall establishment and winter survival throughout the transition zone and further north. Developed by Dr. Gordon Prine at the University of Florida for cold tolerance, improved crown rust resistance and resistance to gray and helminthosporium leaf spot; Fria is a late maturing diploid variety.

For forage production, Fria is typically seeded into dormant warm season grass pastures or after wheat and corn silage harvest to provide grazing, hay, haylage or greenchop through the winter and spring. Recommended seeding rates are 20-25 pounds per acre drilled or 25-35 pounds per acre broadcast in the spring (March-April) or fall (August-early September). Fria provides consistent high quality forage production and excellent grazing under proper management. For hay or haylage, cut when the plant is between the boot and early head stage for optimum yield and quality. For grazing and green chop, start when Fria is 8 to 10 inches tall. Do not graze or greenchop lower than 3 inches.

As a cover crop, Fria can break up natural and manmade hardpans with its deep root penetration when planted in a continuous no-till rotation. Up to 30-90 pounds of nitrogen per acre can be provided for the following crop by recycling the nitrogen in the soil under no-till farming management as long as it is not harvested or grazed. The ability to capture and keep nitrogen and phosphorus in the soil profile after manure applications, preventing nutrient runoff is another big plus. Fria can also greatly reduce soil erosion, especially when planted after corn. Other benefits include reducing soybean cyst nematode populations and potential increased corn and soybean yields due to improved soil characteristics.

PERENNIAL RYEGRASS

(*Lolium perenne* L.)



Uses

Forage: Perennial ryegrass is a valuable forage and soil stabilization plant. This species is the predominant forage grass in Europe and is used extensively in the United States. Perennial ryegrass is used for pasture and hay in sheep, dairy and beef production. It is often used in mixes with alfalfa, clovers and other grasses. Perennial ryegrass has the highest forage quality of all cool season grasses.

Description

Perennial ryegrass is a bunchgrass which grows from 1 to 2 feet tall, and has medium longevity. There are numerous long, narrow, stiff leaves near the base of the plant. The under surfaces of leaves are bright, glossy and smooth. Inflorescence stems are nearly naked. Seedheads are spikes with spikelets growing edgewise to the seedhead stem. Seeds do not have awns (bristles). There are approximately 227,000 seeds per pound.

Adaptation

These grasses have a wide range of adaptability to soils, but thrive best on fertile soils with a pH between 5.5 and 6.5. They produce well in regions having mild climates. They do not withstand hot, dry weather or severe winters. They will stand fairly wet soils with reasonably good surface drainage. Perennial ryegrass is distributed throughout the entire United States.

Establishment

Seed should be planted 1/4 to 1/2 inch deep in a well prepared seedbed. Spring seedings of ryegrass may occur in March, April or May. Perennial ryegrass may also be seeded mid-August to early September.

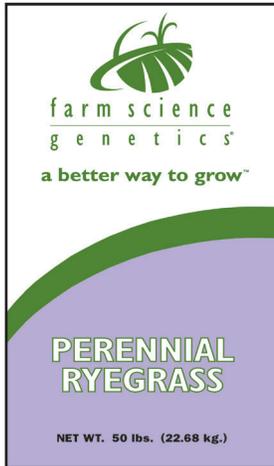
Generally, a rate of 20 to 25 pounds per acre is used if ryegrass is seeded alone. In mixtures, 4 to 8 pounds per acre is recommended, depending upon uses and companion species. In general, the perennial ryegrass component of a mix should be 20% or less since it is very competitive, due to rapid germination and good seedling vigor.

Management

Ryegrass is generally cut for hay when seed heads start to emerge. Established perennial ryegrass-clover pastures should be rotationally grazed when spring growth is 3 to 6 inches high. Allowing 7 to 10 inches of regrowth between grazings will benefit yield and persistence. On new seedings, harvest or grazing should be delayed until plants are 10 to 12 inches tall. Ryegrass responds well to good management, such as intensive rotational grazing and fertilizer applications.



ELENA PERENNIAL RYEGRASS ▾



- **Superior forage yield potential**
- **Excellent forage quality**
- **Vigorous, dark green plants with high disease resistance**
- **Excellent seedling vigor for fast stand establishment**
- **Winterhardy and persistent**

Elena tetraploid perennial ryegrass is a medium maturing variety which has shown superior forage yield potential, excellent forage quality and longer persistence in state trials throughout the United States.

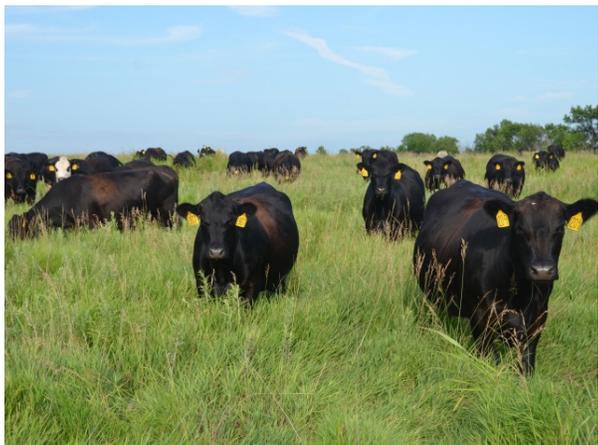
With strong spring and fall forage production plus fast recovery after cutting or grazing, Elena is the ideal component for horse, dairy or beef pasture mixes. Rapid germination and excellent seedling vigor makes this variety perfect for pasture renovation as well. Elena also has great rust and leaf disease resistance which helps maintain palatability and digestibility for improved animal performance.

When all of these varietal characteristics are added up, Elena is without a doubt the best choice for livestock and dairy producers looking for increased weight gains and milk production.



SMOOTH BROME

(*Bromus inermis* Leyss.)



Uses

Livestock: Smooth brome may be used for hay, pasture, silage or stockpiling. It is compatible with alfalfa or other adapted legumes. The grass is highly palatable and is high in protein content and relatively low in crude-fiber content.

Erosion control: Since the plant has a massive root system and is a sod former, it can be used effectively for critical area planting and waterways if the areas can be irrigated or where annual precipitation exceeds 20 inches.

Description

Smooth brome is a leafy, sod-forming, perennial, cool season grass that spreads by rhizomes. The stems vary in height from 2 to 4 feet. The plant produces numerous basal and stem leaves that vary in length from 4 to 10 inches. Frequently, the leaves are marked by a transverse wrinkle resembling a “W” a short distance below the tip. The flower head develops a characteristic rich purplish-brown color when mature. The seed is produced in semi-compact 5 inch long panicles with ascending branches. The flat compressed seed is usually awnless, about 1/3 inch long and smooth. There are approximately 135,000 seeds per pound. Smooth brome is the most widely used of the cultivated bromegrasses and has been cultivated in the U.S. since the early 1880s.

Adaptation and Distribution

Smooth brome is best adapted to cooler climates and is generally hardier than tall fescue or orchardgrass. It is resistant to drought and extremes in temperature.

Smooth brome is susceptible to disease in areas of high humidity. Smooth brome grows best on slightly acidic to slightly alkaline well-drained clay loam soils with high fertility but it will also grow well on lighter textured soils where adequate moisture and fertility are maintained. Smooth brome performs best in a pH range of 6.0 to 7.5. Stands are difficult to obtain and growth is poor on soils high in soluble salts.

Establishment

A clean firm seedbed is needed. Due to the slow germination and establishment of smooth brome, spring seedings are especially preferred in the northern states. In southern areas, late summer seedings are a second option. Fall seedings should be made at least 6 weeks before a killing frost is expected. Seeding rates are typically 5 to 10 pounds per acre in mixtures, and about 10 to 20 pounds per acre when seeded alone. When smooth brome is seeded in a mixture with alfalfa, the alternate row method will give the best results. Seeding depth is approximately 1/2 inch. If broadcast, increase the seeding rate and cultipack after planting.

Management

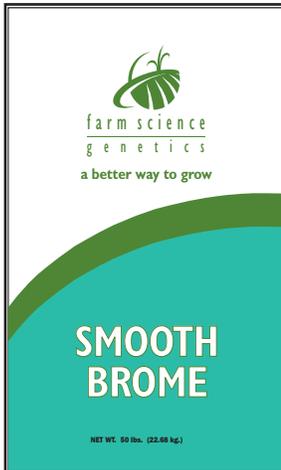
Smooth brome requires heavy early spring and fall applications of nitrogen to maintain high yields in a pure stand. Mixtures with alfalfa will require less nitrogen but the alfalfa will usually need phosphorus each year to maintain vigor. Best forage production is obtained from smooth brome when used in a planned cropping system and plowed out after 3 to 4 years. Its heavy sod makes it an excellent soil conditioning crop when included in cropping systems. In deep, well-drained soils, it will root to 4 feet.

Smooth brome performs best in grassed waterways, field borders and other conservation uses where the forage can be cut and removed while in early bloom. Do not graze the new seeding; cut the first crop for hay.

In bromegrass-legume pastures, allow the legume to go to bud or early-bloom stage before turning cattle in to avoid bloat hazard, and manage thereafter for optimum regrowth of the legume. Pastures should not be grazed prior to smooth brome attaining a minimum height of 10 inches at the beginning of the grazing season. Grazing pressures should be adjusted throughout the season to avoid grazing this grass to less than a minimum height of 4 inches.



PEAK SMOOTH BROMEGRASS



- **Superior vigor**
- **Winterhardy**
- **Persistent**
- **Outstanding dry matter yields**
- **Highly resistant to foliage diseases**
- **Excellent seed quality**
- **Quick recovery after cutting**
- **Highly palatable**
- **Developed by Cornell University**

Achieve higher yields throughout the season with Peak smooth brome grass, an improved and proven product from Farm Science Genetics. Developed by Cornell University, this cool-season hay and pasture forage grass is designed for use in combination with other grasses and legumes.

Developed specifically for persistence and yield, Peak features superior vigor, good winterhardiness, foliage disease resistance and excellent seed quality. Growing 20 to 40 inches tall, Peak smooth brome grass produces high dry matter yields, recovers quickly after cutting and is highly palatable to livestock.



REED CANARYGRASS

(*Phalaris arundinacea* L.)



Uses

Forage: Reed canarygrass is primarily adapted for permanent hay or pasture on sites too wet for good performance of other forage plants. The forage should be grazed or mowed prior to heading as both quality and palatability decline rapidly after heading. A common mistake is to use reed canarygrass on wet sites where timely harvest is not possible. Make sure to use low alkaloid varieties for increased forage quality and palatability.

Erosion control: The extensive, rhizomatous root system and dense growth of reed canarygrass provide excellent erosion control, especially along stream banks, shorelines and waterways. Reed canarygrass invades wet areas so its use along ditches, canals and drains can create maintenance problems; it can also be troublesome in wetland habitats.

Wildlife: This grass provides excellent nesting and escape cover and the shattered seeds are readily eaten by many species of birds.

Description

Reed canarygrass is a vigorous, productive, long-lived, perennial, sodforming grass. It is a widespread species native to North America, Europe and Asia. The numerous broad, moderately harsh, erect leaves are dominantly basal. The coarse, erect stems may reach a height of 6 to 8 feet. Seed is borne in an open panicle which ripens from the top down and shatters readily as it matures. There are approximately 480,000 seeds/pound. The seed has a short storage life and should be checked for germination within 6 months of its use. Reed canarygrass has excellent frost tolerance and is well suited to wet soils that are poorly drained or are subject to flooding. It also has good drought tolerance.

Growth begins in early spring and continues through the growing season. Regrowth following mowing or grazing is rapid on fertile sites. Forage quality is good prior to heading but then declines rapidly.

Adaptation and Distribution

Reed canarygrass is adapted to soils too wet for bromegrass, fescue and orchardgrass. It is very cold tolerant and will withstand temperatures well below 30°F. It is moderately drought tolerant but requires 18 inches annual precipitation or irrigation for good performance. It is adapted to a wide range of soil conditions but its major use is on poorly drained soils or those subject to inundation. Once established, it will withstand continuous inundation for 60 to 70 days. It does well on soils that range from moderately acidic to weakly saline-alkaline. It will tolerate saltier soils with frequent irrigation or natural flooding.

Establishment

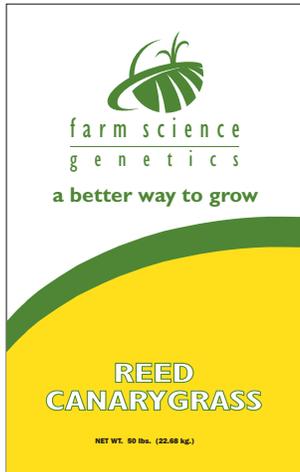
A firm, moist, clean seedbed is needed for good emergence. The seed germinates readily but is somewhat slow to establish. Seed pure stands at a rate of 14 pounds/acre and 6 to 8 pounds/acre for mixtures. Seeding should be done in late fall or early spring. Plant shallow, no deeper than 1/2 inch. If necessary, irrigate to maintain surface moisture until plants are well established.

Management

New seedlings should not be grazed until fully established. It is best to harvest for hay 1 to 2 times before grazing. To maintain plant vigor and promote rapid regrowth, leave a stubble of 3 to 4 inches after mowing or grazing. Start spring grazing after plants reach a height of 10 to 12 inches. Maintain grass height below 12 inches during rapid spring growth. Harvest hay when the first seedheads appear. Reed canarygrass will persist under close, frequent use, but yield will be greatly reduced. Its persistence under heavy use makes it well suited for calving, lambing, holding areas or other special-use pastures. To maintain good yields, an annual application of fertilizer will be required on most fields depending on soil test results.



MARATHON REED CANARYGRASS



- Leafy, high yielding, perennial forage grass
- Widely adapted
- Persistent
- Performs well on wet, poorly drained soil and soils with a pH below 6.0
- Very drought tolerant variety that can be used for hay, silage or pasture
- Low alkaloid

Marathon has short rhizomes that spread, creating a dense sod. It has greater winterhardiness and is more resistant to foliar disease than other cool-season grasses. Use Marathon for hay, silage or pasture. When cut for hay or silage, quality is optimal before seed heads appear and then rapidly declines. Forage yields are excellent in the spring and early summer and are fair to good in late summer and early fall. When used as pasture, grazing Marathon down to 3 to 4 inches above the ground will make the best utilization of the forage. Allow the grass to recover before regrowing, always keeping the grass below 12 inches tall during rapid spring growth.

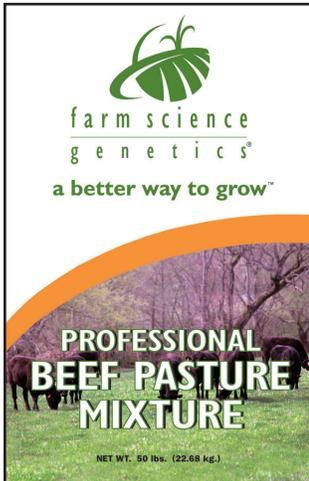




farm science
genetics®

PROFESSIONAL PASTURE MIXES

PROFESSIONAL BEEF PASTURE MIXTURE ▼



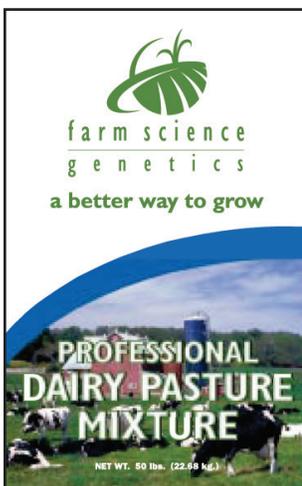
- Components are present in the proper ratios to provide optimum pasture
- Premium quality components selected for regional adaptation and performance
- Maximum production per acre
- Produces high-quality, balanced hay
- Good general pasture mixture

Professional Beef Pasture Mixture was created to meet the needs of producers who want to optimize animal performance and maximize per acre return. It's also a good choice for hay producers who want a high-quality, balanced hay.

To meet these needs, we start with only the highest quality ingredients. These species are carefully chosen for their regional adaptability and combined in the proper ratios to assure maximum pasture production.

This premium mixture, along with good management practices, will provide you with the best opportunity to optimize the return on your management investment.

PROFESSIONAL DAIRY PASTURE MIXTURE ▼



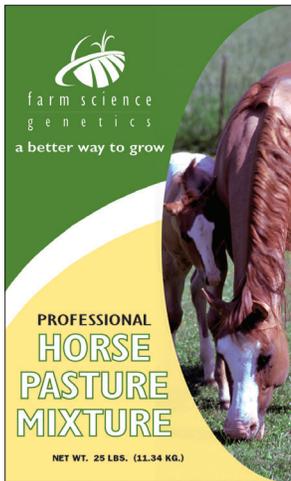
- Superior yield
- Excellent palatability
- High protein for maximum milk production
- Endophyte-free tall fescue provides maximum performance and eliminates concerns about animal health
- Strong persistence and re-growth that withstands grazing pressure
- Excellent drought tolerance and winterhardiness
- Resists many common diseases

Formulated to maximize performance of dairy cattle, Professional Dairy Pasture Mixture is a specially selected blend of unique, high-quality grasses, clovers and alfalfas that provides a balance of exceptional yield, nutrition, persistence and disease resistance. This mixture was created to meet the needs of producers who want to optimize animal performance and maximize per-acre return.





PROFESSIONAL HORSE PASTURE MIXTURE ▾



High quality pastures can provide much of the feed needed by horses while providing the most natural and healthy environment for exercise and rest. Establish this type of productive environment — a healthy, safe and attractive pasture — for your horses, by using the quality components in Professional Horse Pasture Mixture.

Farm Science Genetics Professional Horse Pasture Mixture is a forage blend specially formulated to meet the nutritional needs of horses while withstanding their intense grazing pressure.

AVAILABLE IN A SOUTHERN AND NORTHERN MIX!



BERMUDAGRASS

(Cynodon dactylon (L.) Pers.)



Uses

Erosion control: Bermudagrass is used for critical area planting (including channels and pond banks), grassed waterways and vegetated flumes.

Livestock: Bermudagrass provides excellent pasture and hay with proper management. Forage quality is dependent on soil fertility and stage of growth.

Description

Bermudagrass is probably Asian in origin and was documented as an important grass in the United States by 1807. It is a long-lived, warm season perennial that spreads by rhizomes, stolons and seed. Stems are leafy, branched and 4 to 6 inches tall. Under favorable conditions, stems may be 12 to 18 inches high. Stems are short jointed. Leaves are flat and spreading. The ligule is a circle of white hairs. Leaves may be hairy or smooth. Seed heads are usually in one whorl of 3 to 7 spikes, each about 1 to 2 1/2 inches long. Some robust forms may have up to 10 spikes in 2 whorls. There are approximately 2,071,000 hulled seeds per pound.

Adaptation and Distribution

Although a few hardy strains of Bermudagrass persist in areas with sub-zero winter temperatures, it has achieved importance only in areas of relatively mild winters. Once established on moderately deep to deep soils, Bermudagrass maintains dense sod with 16 inches of rainfall. It can withstand sedimentation and long periods of inundation.

It prefers full sun and can grow rapidly at air

35 temperatures exceeding 100° F.

Bermudagrass prefers deep soils but produces well on moderately shallow sites under irrigation and good management. It persists on poor soils but requires high nitrogen levels for best appearance. It withstands pH ranges from about 5.0 to 8.5 and is boron tolerant. It tolerates saline soils with up to 18 millimhos of electrical conductivity in the soil solution.

Establishment

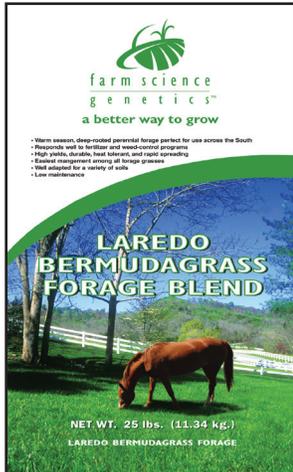
Stands may be established by use of seed, sprigs or plugs planted during mid-spring to mid-summer followed by frequent applications of fertilizer and water. Early planting is most important in areas of marginal adaptability. Beds for seeding or planting should be firm, smooth and free of weed seed. Seed, sprigs or plugs should be placed into moist soil. For pasture or hay, drill 5 to 10 pounds of hulled seed per acre at 1/4 inch depth or less. Higher seeding rates are advisable if seed is broadcast

Management

Both pasture and hay require good rainfall and heavy fertilizer application for high yield and quality. Thirty to 40 pounds of nitrogen should be applied in split increments for each ton of anticipated dry forage yield. Highest yields are obtained on good soils in areas of high average annual temperature with ample water. Harvest or graze at 3 to 4 week intervals for best yields of total digestible nutrients and protein.



LAREDO BRAND BERMUDAGRASS



- **Highly productive for hay, green chop or pasture**
- **Excellent palatability**
- **Spreads rapidly**
- **Extremely heat tolerant**
- **Cold tolerant**
- **Drought and alkali tolerant once established**

Laredo is a specially formulated blend of hulled, coated proprietary Bermudagrass seed for improved stand establishment. Laredo's growth characteristics create a more versatile forage for high quality hay, grazing and silage.

Laredo can be planted in the spring or summer after any danger of frost is past and when the soil temperature is consistently above 65°. Planting in late summer or early fall can also be done as long as a minimum of 60 days of good growth occurs before a frost. General planting rates are 12-15 lbs. per acre at a maximum depth of 1/4 inch. White clover can also be seeded with Laredo to improve forage quality, extend the grazing season and supply part of the nitrogen required for optimum production. Please check regional recommendations for specific planting dates and seeding rates. With proper management and ideal growing conditions, Laredo will be ready to cut or graze 45-50 days after seeding.

Laredo should be cut for hay or silage when it reaches 16" in height and then every 4-6 weeks thereafter. The last cutting should be approximately 8 weeks before the first killing frost occurs. Laredo should be grazed when it reaches a height of 4 to 8 inches and continue to be grazed until it is 1 to 2 inches in height.

After Laredo becomes dormant in the fall, a number of annual grains, grasses and legumes can be overseeded for productive winter forage.

Laredo is widely adapted throughout the transition zone and the southern United States. Laredo is very heat and drought tolerant, grows well on light to heavy soils and can perform over a wide soil pH range.



SUMMER ANNUALS



Summer annual grasses play an important role in the production of high quality feed and forage during the summer months when cool season grasses and legumes become semi-dormant or non-productive. They are especially well suited for areas with limited moisture due to drought or declining water tables. Summer annual grasses are also effectively used as an emergency forage crop when perennial forage or corn crops will not have adequate production.

Each summer annual grass variety and species has its own special attributes that make it the best choice for a specific application, but they all have several characteristics in common such as efficiently utilizing inputs, growing well under relatively high temperatures and producing forage under limited moisture conditions.

The Farm Science Genetics® line of summer annual grasses are selected for their unique performance characteristics that result in top yield and forage quality with the flexibility to adapt to your management needs.



TEFF (SUMMER LOVEGRASS)

(*Eragrostis teff*, Zucc.)



Uses

Teff is mainly utilized for hay in pure stands or as an emergency hay crop. Other uses include grazing, silage, erosion control and green manure.

Description

Teff is a warm season annual grass native to Ethiopia. Plants are fine stemmed with large crowns and many tillers. Roots are shallow and develop a massive fibrous root system. Plant height at maturity is typically 3 to 4 feet, but varies depending on variety and environmental conditions. When harvested at the proper stage, crude protein will normally be in the 15% to 20% range. Teff has an open panicle type seed head. There are approximately 1.3 million seeds per pound. When seed is coated at 50% there are approximately 650,000 seeds per pound.

Adaptation and Distribution

Teff is widely adapted throughout the United States and can be cultivated under a wide range of environmental conditions such as on marginal soils under water logged to drought conditions. Teff seed will not germinate well in cool soils. Plants are highly susceptible to cold and will die if temperatures drop to 32 degrees or lower.

Establishment

Teff is easy to establish due to its rapid germination (3 to 6 days) provided seed is planted in a firm seedbed and the soil temperature is 65 degrees or higher. Plant after all risk of frost has passed. Seeding rates are 8 to 12 coated pounds per acre or 4 to 6 raw pounds per acre at a seeding depth of 1/8 to 1/4 inch. Planting deeper will usually result in a complete stand failure. Stand failures may also occur when planting after small grains unless the stubble is thoroughly incorporated into the soil. Initial growth is slow until a good root system has been established.

Management

In general, 50 pounds of nitrogen per acre at planting will be adequate for good forage production. Small amounts of nitrogen may be needed after each cutting, however, too much nitrogen causes severe lodging. Soil testing is important since teff needs adequate phosphorous, potassium and sulfur for optimum growth.

For optimum forage quality, teff should be harvested in the pre-boot to early boot stage, approximately 45 to 50 days after planting at a minimum cutting height of 4 inches. Harvest regrowth in 30 to 45 days depending on environmental conditions.

DESSIE TEFF



- **High yielding warm season annual forage grass variety**
- **Excellent palatability and forage quality**
- **Ideal for horses and other livestock**
- **Great for use as an emergency forage crop and for double cropping**
- **Good for interseeding thin alfalfa stands in final year of production**
- **Excellent rotational crop when replacing alfalfa or perennial grass stands**
- **Can be used as a green manure crop and for erosion control**
- **Plant after all risk of frost has passed**

Dessie Teff is a warm season annual grass variety developed for high forage production and forage quality without the problems of other summer annual grasses such as prussic acid or nitrate buildup. Dessie makes the ideal horse hay with great palatability, digestibility, a mineral content high in calcium and iron and an attractive green color which is important for the premium horse hay market. Dessie is widely adapted throughout the United States and will tolerate drought conditions as well as wet soils. Dessie is a low input crop that has very few disease or pest problems and does not require high amounts of fertilizer for optimum production. Remember, for profitable summer forage production, Dessie is the answer.

COWVITTLES II HYBRID FORAGE SORGHUM

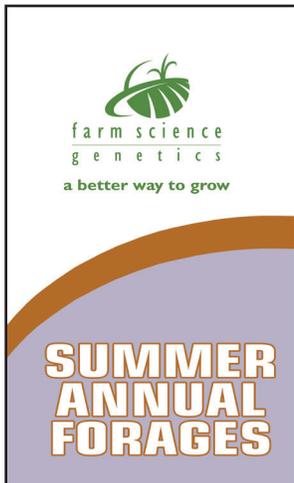


- **Dense lush leaf with a large grain head**
- **Resistant to Downy Mildew**
- **High yield potential which is excellent for silage**

Cowvittles II is a conventional hybrid forage sorghum with high yield potential. A dense lush leaf type with a large grain head, Cowvittles II sets the standard for forage sorghums.



FSG 114 BMR6 HYBRID FORAGE SORGHUM ▾



- **Significantly lower stem lignin concentration**
- **Improved digestibility & palatability equals milk production of rations with corn**
- **Requires 1/3 less water than corn for same production**
- **Male sterile hybrid**
- **Dry stalk gene improves harvest timing**
- **85 day maturity**

FSG 114 BMR6 is a brown midrib, male sterile hybrid forage sorghum. Because the lignin content of the stalk has been dramatically reduced, digestibility improves by 35% over conventional forage sorghums. FSG 114 BMR6 forage sorghum, with this improvement in digestibility and palatability, can equal the milk production of rations with corn. Plant at the recommended rates for your area and harvest timely for optimum yield and quality. The water requirement for FSG 114 BMR6 is 1/3 less than would be required to produce an equivalent amount of corn. Because FSG 114 BMR6 is a male sterile hybrid, volunteer growth is not an issue provided there is adequate isolation from pollen fertile sorghums.

FSG 115 BRACHYTIC DWARF BMR6 HYBRID FORAGE SORGHUM ▾



- **Dwarfing gene increases leaf to stem ratio and provides superior standability**
- **Significantly lower stem lignin concentration**
- **Improved digestibility & palatability equals milk production of rations with corn**
- **Requires 1/3 less water than corn for same production**
- **Grain producing hybrid**
- **95 day maturity for northern states and 110 day maturity for transition states**

FSG 115 is a brachytic dwarf, brown midrib, grain producing hybrid forage sorghum. Because the lignin content of the stalk has been dramatically reduced, IVDMD is 40% greater than conventional forage sorghums. FSG 115 with this improvement in digestibility and palatability, can equal the milk production of rations with corn with a water requirement 1/3 less than would be required to produce an equivalent amount of corn. Because FSG 115 is a grain producing hybrid, energy will increase as carbohydrates form in the grain head.

FSG 118 BMR6 HYBRID FORAGE SORGHUM ▼



- **Significantly lower stem lignin concentration**
- **Improved digestibility & palatability equals milk production of rations with corn**
- **Requires 1/3 less water than corn for same production**
- **Male sterile hybrid**
- **Dry stalk gene improves harvest timing**
- **75 day harvest maturity**

FSG 118 BMR6 is a brown midrib, male sterile hybrid forage sorghum that reaches harvest maturity approximately 75 days from planting. Because the lignin content of the stalk has been dramatically reduced, digestibility improves by 35% over conventional forage sorghums. FSG 118 BMR6 forage sorghum, with this improvement in digestibility and palatability, can equal the milk production of rations with corn. Plant at the recommended rates for your area and harvest timely for optimum yield and quality. The water requirement for FSG 118 BMR6 is 1/3 less than would be required to produce an equivalent amount of corn. Because FSG 118 BMR6 is a male sterile hybrid, volunteer growth is not an issue provided there is adequate isolation from pollen fertile sorghums.

GREENGRAZER V HYBRID SORGHUM-SUDANGRASS ▼

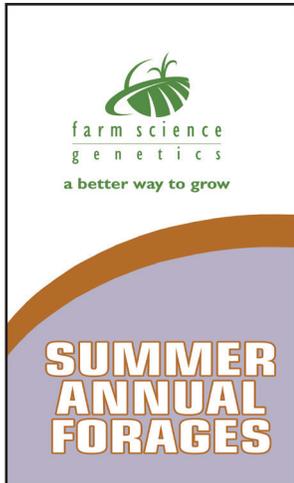


- **Small seeded and thin stemmed type**
- **Dark green color with Green Top trait**
- **Anthraco-nose and Downy Mildew resistant**

Greengrazer V is a small-seeded three way cross with thin stems that are highly palatable. Regrowth after cutting is very fast. Greengrazer V is a dark green color and also possesses the Green Top trait, which allows for further extension of the plant. Planting Greengrazer V, at higher populations per acre, will result in a finer stemmed forage. Finer stems will allow the forage to dry faster for higher quality hay than is possible with thick stemmed types. For grazing, wait until plants are 18"-36" tall. Remove cattle when plant height has been grazed down to 8".



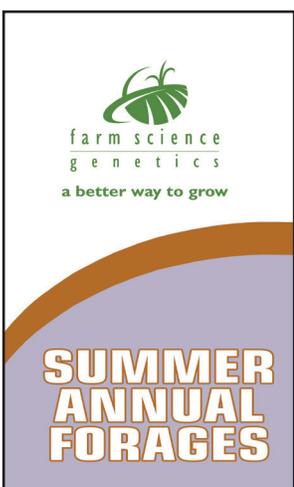
FSG 214 BMR6 HYBRID SORGHUM-SUDANGRASS ▾



- **Up to 20% increase in digestibility**
- **Significant increase in palatability**
- **Dry stalk gene improves harvest timing**
- **Multiple uses: hay, grazing, greenchop and silage**

FSG 214 BMR6 is an exceptional quality hybrid sorghum-sudangrass with excellent early vigor and high yield potential. The dry stalk gene improves dry-down and normally shows 8-10% lower moisture in the boot stage. FSG 214 BMR6 tillers profusely, producing fine sweet stems for high palatability. This hybrid shows an increase of up to 20% in digestibility due to the reduction in lignin with the BMR6 gene, providing increased daily gains in milk and beef production. When compared to BMR sudangrass hybrids, FSG 214 BMR6 is more economical to plant, produces more dry matter yield, has similar stem size and higher overall quality.

FSG 215 BMR6 HYBRID SORGHUM-SUDANGRASS ▾



- **High yield potential**
- **Up to 20% increase in digestibility**
- **Multiple uses: hay, grazing, greenchop and silage**
- **Excellent for 1-3 cut forage systems**

FSG 215 BMR6 produces some of the highest dry matter yields of any BMR and non-BMR hybrid sorghum-sudangrass commercially available. With excellent nutritional quality and early vigor, FSG 215 BMR6 is highly digestible with increased efficiency and improved animal utilization due to reduced lignin, the limiting factor in forage digestibility. This hybrid has excellent drought tolerance and is quick growing, producing the maximum tonnage in the shortest amount of time. Fine, sweet stems makes FSG 215 BMR6 an excellent choice for grazing, hay, greenchop and silage.

FSG 300 HYRBID PEARL MILLET ▾



- **Bushy type hybrid with high yield potential**
- **Widely adapted to many diverse geographic regions**
- **No Prussic Acid concerns**

FSG 300 is a bushy type hybrid pearl millet with high yield potential which is achieved very quickly needing only 63 days to reach the boot stage. FSG 300 has a high level of tolerance to many pathogens and high humidity, but cannot tolerate standing surface water. FSG 300 can be grown on as little as 16 inches of water, however, greater tonnage will be produced with greater water availability.

FSG 300's bushy type plant stature means that the forage produced is virtually all leaves. This greater leaf mass gives FSG 300 high crude protein concentrations and high TDN values.

FSG 315 DWARF BMR HYBRID PEARL MILLET ▾



- **BMR gene technology reduces plant lignin content versus conventional hybrid pearl millets, which results in a highly digestible forage with improved nutritional quality**
- **Extensive tillering capacity**
- **High yield potential**
- **Dwarfing gene increases the leaf to stem ratio, improves standability and allows heavier grazing pressure**
- **Adapted to a wide soil pH range**
- **No Prussic Acid concerns**

FSG 315 is a new concept in hybrid pearl millets with BMR and Dwarfing gene technology. The BMR gene reduces plant lignin versus conventional pearl millets resulting in a highly digestible forage with improved nutritional quality for superior animal performance. The Dwarfing gene increases the leaf to stem ratio for higher forage quality, improves standability in the field and allows heavier grazing pressure with its extensive tillering. With high yield and quality potential, an excellent disease resistance package, drought stress tolerance and rapid growth, FSG 315 is ideal for the grower who wants the flexibility of grazing, hay or silage.



HYBRID GRAIN SORGHUM AGRONOMIC CHARACTERISTICS													
VARIETY	MATURITY	PLANT HEIGHT	GRAIN COLOR	HEAD TYPE	STANDABILITY	STRESS TOLERANCE	GREENBUG TOLERANCE	SUGARCANE APHID TOLERANCE	HEAD SMUT	DOWNY MILDEW	ANTHRACNOSE	MDMV	SEEDS PER LB.
FSG 801	EARLY 50-52 DAYS	42-48"	RED	Semi-Open	Excellent	5	C & E	3	3	4	5	4	14 K
FSG 251	MED-EARLY 53-57 DAYS	40-45"	RED	Semi-Closed	Excellent	5	C & E	N/A	5	5	3	5	12 K
FSG 255C	MED-EARLY 55-60 DAYS	40-45"	CREAM	Semi-Closed	Excellent	5	C & E	N/A	5	5	3	5	15 K
FSG 425	MEDIUM 62-65 DAYS	45-50"	RED	Semi-Open	Excellent	5	C & E	N/A	5	5	4	5	16 K

Rating System: 1=POOR 5=EXCELLENT

WILDLIFE GRAIN SORGHUM ▾



- Developed specifically for game birds
- Resistant to sparrows and blackbirds during milk stage
- Grain is resistant to weather deterioration

Wildlife Grain Sorghum was specifically developed as a fall and winter food source for upland game birds (quail, turkey, pheasant and prairie chicken) and migratory birds (ducks, geese and doves). Unlike many conventional grain sorghum hybrids, Wildlife Grain Sorghum imparts a bitter grain taste to predatory birds (sparrows, blackbirds, starlings, etc.) during the milk and dough stages of development. The bitter taste disappears when the seed reaches maturity.

Wildlife Grain Sorghum is a heavy seed producing, early maturing (50-55 days to mid-bloom) variety which has early planting cold tolerance and excellent tillering for greater variation of grain maturity. Plant height is 35 to 40 inches for easy hunting. The white seed color is only in the pericarp layer of the seed and acts as a mold and rotting repellent for the grain during exposure to winter weather conditions. In addition to providing a non-weathering and non-rotting winter food source, the foliage provides an excellent source of beneficial cover for birds.

Wildlife Grain Sorghum is not meant for commercial grain production due to high tannin content.