FORAGE GUIDE

Volume 3

CISCO SEEDS

A Division of The CISCO Companies

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FORAGE & FIELD GUIDE
VOLUME III

SUCCESSFULLY PLANTING SMALL SEEDS

The 2017 farming season was very tough on forage stands in the Midwest, especially the spring seeded forages. After numerous field visits, it really demonstrated the differences in field preparation. Let's dive into this a little bit. In the right year, just about anything will work when planting small seeds; however, in a challenging year it pays to do a good job planting small seeds. The failure rate can be high. The most important thing is that small seeds need good seed to soil contact at the proper depth. The good contact allows the seed to absorb moisture, germinate, and establish roots into the soil. Seeding depth is just as important because small seeds need to germinate and start photosynthesis soon after emerging. Most forage seeds don't have the energy that a corn seed has. So alfalfa seedlings can come out of ¼" of soil, not 2" like a corn plant can.

Loose seedbeds cause two problems for small seeds. One is uneven emergence due to poor seed to soil contact. Not all of the seeds will absorb moisture at the same rate, which will cause uneven emergence. Even worse is that they can't absorb enough moisture to germinate. An uneven forage stand provides excellent areas for weeds to fill in the holes and take over. A thick seeded and growing stand of forages is a great form of weed control. The other problem loose seedbeds provide is poor seeding depth. Ideally forages need to be seeded between ¼" to ½" depending on the soil type. Planting small seeds deeper than the recommended depth reduces the stand. This is due to uneven emergence or no emergence because the seedling runs out of energy before it can start capturing sunlight.

When seed is broadcast or planted with a conventional grain drill, some farmers talk about using a disc or harrow to "scratch" the seed in. I have yet to see a disc that can move ¼" to ½" of soil. Many times this action buries the seed too deep. A better alternative is a packer or a Brillion seeder. Convention drills without press wheels work well with a packer pulled behind them.

Another common cause of a poor seedbed is the use of a rototiller. The tillers are very good at burying weeds and residue. However, they can leave the seedbed too loose. It is best to make sure to use a packer to firm the soil up after using the tiller.

No-till seedings work well if the forage seed can be placed shallow enough. Many no-till drills are made for larger seed placement, so special attention and setup needs to be done when planting forages. Get off the tractor and check seed rate and depth. Another key to no-till is effective, planned weed control. Too much residue will cause shading issues, hairpinning in the seed slot, and poor depth control.

A few rules of thumb for planting small seeds:

- Firm seed bed is being able to walk on the soil and only sink in ½-3/4 of an inch.
- It is better to see 10-15% of the seed on the soil surface. That means you are not burying it too deep.
- If you can't find any seed on the soil surface, shallow up the planting depth.
- Don't just drive the tractor, get off and check out what is going on.
- Take your time, forage seed and lost time are both expensive.

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Legumes

Forage legumes are used on farms and ranches across the nation to improve forage yields and quality. Legumes produce their own nitrogen (N) in a symbiotic relationship with certain strains of bacteria. These bacteria provide the plant with nitrogen (N), while the plant provides carbon (C) to the bacteria. The bacteria attach to the plant to form nodules. Legumes generally have a higher crude protein (CP) level than grasses. They can produce up to 250 lb/A of nitrogen (N) and have a crude protein (CP) level range from 15-25%.

Alfalfa

Alfalfa is the fourth most widely grown crop in the United States. It is high yielding, high quality, and very persistent once established. It is utilized by dairy, beef, horse, and other livestock industries. It can be grown alone or mixed with grasses, such as orchardgrass, timothy, brome, or fescue. It is high in forage quality, with crude protein levels ranging from 15-22%. Alfalfa grows best on soils that are well drained, high in fertility, and have a pH ranging from 6.5-7.0. At *CISCO*, we continue to work with the finest alfalfa companies to bring you the latest traits and best genetics for your farming operation.

Alfalfa

Plant type: Perennial Legume	Days to germination: 7–10
Planting dates: March–April or Aug–Sept.	Main usage: Pasture, hay, silage
Soil pH: 6.6–7.2	Height at maturity: 15”–36”
Soil adaption: Well drained, high fertility	Length of stand: 3–7 years
Planting depth: 1/8”–1/4”	Reproduces by: Seed
Approximate seeds/lb: 227,000	Pounds per bushel: 60
Seeding rate: 14–20 lbs/A 8–10 lbs/A mix	Precautions: Bloat Potential

Enduro 420HD

- Enduro 420 HD is a highly digestible, dairy quality FD 4 alfalfa
- It is adapted to a wide range of soil types
- Non-GMO breeding for enhanced and extended forage quality
- Retains forage quality up to 35 days harvest allowing for a wider harvest window
- 4-5 cuts per season
- A product of Legacy’s HD™ program

Enduro Elite

- Fall dormancy 4, high yielding alfalfa
- StandLife Genetics™ – this program consists of alfalfa varieties bred for multi strain resistance to Aphanomyces Race 2 and 3
- Outstanding resistance to Aphanomyces Race 1, 2, and 3, protects the roots
- Works well in a 4/5 cut system
- Rapid regrowth with fine stems
- Branch root trait

Enduro 427 LHR

- "8th Generation" potato leafhopper resistance
- Very winterhardy and persistent; delivers long stand life under tough weather conditions
- Disease resistance index (DRI) of 30/30 produces big yields on your toughest soils
- A true no-spray, non-GMO PLH resistant alfalfa
- Available with OMRI approved Apex Green Coating

CISCO 328

- Fall dormancy 3 alfalfa, winterhardiness 1.8
- Large crowns with good tillering and heaving tolerance
- Superior persistence due to excellent disease package
- Reasonably priced – tremendous value
- Excellent forage quality
- Available with OMRI approved Apex Green Coating

Attention II

- Fall dormancy 5 alfalfa, recommended for aggressive alfalfa managers
- StandFast™ Alfalfa Technology for improved plant standability
- Well suited for 4/5 cuts per season
- Reaches late bud/early flower stage 3-5 days ahead of most FD 4 alfalfas
- Easy to harvest

SIX DECADES OF ALFALFA DOMINANCE JUST GOT ONE GENERATION BETTER.

The Future of Alfalfa is Here with 2018 BIG 3 ALFALFAS

WL ALFALFAS

HARVXTRA® ALFALFA WITH ROUNDUP READY® TECHNOLOGY

WL 341HVX.RR

- Tremendous value of flexibility in choosing to maximize unmatched fiber digestibility, or accumulate greater yield by delaying cutting frequency, without sacrificing feed quality
- Reduced-lignin % (ADL, acid detergent lignin) content of 27% less than the average of competitive check varieties gives WL 341HVX.RR 28% higher RFQ and 25% higher NDFD that the average of competitive check varieties
- Superb yield potential and agronomic characteristics under 3-cut system if extending cutting frequency, or under 4- to 5-cut systems to maximize feed value
- FD 4, WH 2.1 and 30/30 DRI

HARVXTRA with Roundup Ready® Technology

WL 375HVX.RR

- WL 375HVX.RR offers multi-dimensional use in significantly improved quality, for maximizing fiber digestibility or greater DM yield
- Reduced-lignin % (ADL, acid detergent lignin) content of 22% less than the average of competitive check varieties gives WL 375HVX.RR a 16% greater RFQ (relative forage quality), and a 18% greater NDFD (neutral detergent fiber digestibility) than the average of competitive check varieties
- New generation disease package with high resistance to multi-race aphanomyces root rot (Race 1, 2 and 3), and anthracnose
- FD 5, WH 2.1 and 40/40 DRI

HARVXTRA with Roundup Ready® Technology

ROUNDUP READY® ALFALFA

WL 359LH.RR

- 8th generation HopperShield™ protection in a Roundup Ready® package
- Impressive vigor under moderate or heavy PLH pressure
- Excellent yield potential and forage quality in a 3 to 5-cut management system
- FD 4, WH 2.2, 30/30 DRI

HOPPER SHIELD Roundup Ready ALFALFA

WL 356HQ.RR

- Industry-leading Aphanomyces Race 2 resistant Roundup Ready® alfalfa
- Powerhouse of yield and disease resistance
- FD 4, WH 1.6, 35/35 DRI

HQ Roundup Ready ALFALFA

WL 372HQ.RR

- Our highest-yielding dormant Roundup Ready® alfalfa released-to-date
- For aggressive and intensive managers; adapted for 4- to 6-cut systems
- FD 5, WH 1.8, 30/30 DRI

HQ Roundup Ready ALFALFA

For more information, visit wlresearch.com.

WL 354HQ

- Fall dormancy 3.9 HQ alfalfa, winterhardiness 1.4
- Unique wet soil disease package with a DRI 35/35
- Highly resistant to Aphanomyces Race 2
- High yield potential under 3-5 cut system
- Excellent later-maturing companion to WL 365HQ

WL 358LH

- Fall dormancy 4 alfalfa with true “no spray” PLH resistance
- 8th generation, 93% resistance to potato leafhoppers (granular hair expression)
- Works well in a 3-5 cut system
- Delivers peace of mind insurance on yield, quality, and persistence
- Non-GMO; available with OMRI approved coating for potential organic eligibility

WL 365HQ

- Fall dormancy 5 HQ alfalfa
- High yield potential under 4-6 cut system
- Highest yielding winterhardy conventional alfalfa
- Fine-stemmed, dark green plants
- Rapid regrowth with great standability
- Extreme winterhardiness (1.1 rating)

WL 356HQ.RR

- Fall dormancy 4 HQ alfalfa with Genuity® Roundup Ready® technology
- Unique wet soil disease package with a DRI 35/35Highly resistant to Aphanomyces Race 2
- High yield potential under 3-5 cut system
- For your toughest soils
- Very winterhardy

WL 359LH.RR

- Fall dormancy 4, PLH resistant, Genuity® Roundup Ready® alfalfa
- 8th generation, 86% resistance to potato leafhoppers
- Works well in a 3-5 cut system
- Superb weed control during establishment and throughout the life of the stand
- Third and latest release of stacked glyphosate tolerance and potato leafhopper resistance

WL 372HQ.RR

- Fall dormancy 5 HQ alfalfa with Genuity® Roundup Ready® technology
- Highest yielding FD 5 RR alfalfa
- Best utilized in a 4-6 cut system
- Ideal for intensive alfalfa managers looking for outstanding weed control

HARVXTRA™

WL 341HVX.RR

- 15% reduced lignin as compared to traditional alfalfa
- Tool for dealing with poor weather conditions at harvest
- Increase yield and forage quality
- FD 4, DRI 30/30, WH 2.1
- 3 to 5 harvests per year
- Clean fields with Roundup Ready weed control

WL 375HVX.RR

- FD 5 alfalfa with up to 22% reduced lignin
- DRI 40/40, HR to Aphanomyces R 1,2, and 3
- 4-6 cuttings per year
- Unmatched forage quality
- Clean fields with Roundup Ready weed control

Alfalfa Performance

	Enduro 420 HD	Enduro Elite	Enduro 427LHR	WL 354HQ	WL 356HQ.RR	WL 358LH
Fall Dormancy	4	4	4	3.9	3.8	4.1
Winterhardiness	2	2	1.9	1.4	1.6	2
DRI	30/30	35/35	30/30	35/35	35/35	30/30
Fusarium Wilt	HR	HR	HR	HR	HR	HR
Phytophthora Root Rot	HR	HR	HR	HR	HR	HR
Bacterial Wilt	HR	HR	HR	HR	HR	HR
Verticillium	HR	HR	HR	HR	HR	HR
Anthracnose Race 1	HR	HR	HR	HR	HR	HR
Aphanomyces Race 1	R	HR	HR	HR	HR	HR
Aphanomyces Race 2	R	HR	**	HR	HR	**
Roundup Ready	No	No	No	No	Yes	No
Potato Leafhopper Resistant	No	No	87%	No	No	92%

** Not rated

	WL 359LH.RR	WL 365HQ	WL 372HQ.RR	WL 341HVX.RR	WL 375HVX.RR
Fall Dormancy	3.9	4.9	4.8	4	4.6
Winterhardiness	2.2	1.1	1.8	2.1	2.1
DRI	30/30	30/30	30/30	30/30	40/40
Fusarium Wilt	HR	HR	HR	HR	HR
Phytophthora Root Rot	HR	HR	HR	HR	HR
Bacterial Wilt	HR	HR	HR	HR	HR
Verticillium	HR	HR	HR	HR	HR
Anthracnose Race 1	HR	HR	HR	HR	HR
Aphanomyces Race 1	HR	HR	HR	**	HR
Aphanomyces Race 2	**	**	**	**	HR
Roundup Ready	Yes	No	Yes	Yes	Yes
Potato Leafhopper Resistant	86%	No	No	No	No

** Not rated

WL 375HVX.RR

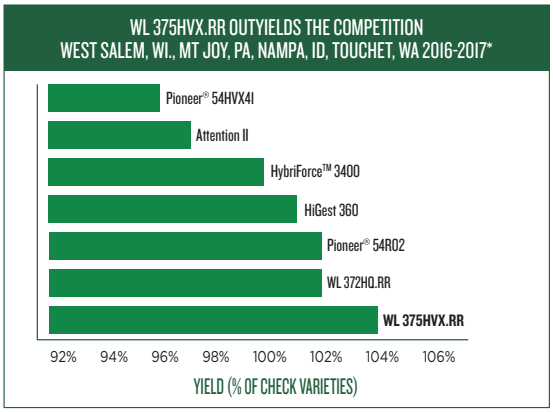
FD5

W-L ALFALFAS BULKS UP HARVXTRA® ALFALFA LINEUP WITH FD5 ADDITION

W-L HarvXtra® Alfalfa is a revolutionary new offering in alfalfa production, our first fall dormancy, simply put, 5 release, WL 375HVX.RR delivers. WL 375HVX.RR compliments the introductory 2016 release of FD4 WL 341HVX.RR, offering another valuable winterhardy option with a new, superior agronomic package and the HarvXtra® Alfalfa trait.

WL 375HVX.RR Advantages

- WL 375HVX.RR offers tremendous value of flexibility in choosing to maximize fiber digestibility, or realize greater yield by delaying cutting frequency, perhaps removing 1 cut, without sacrificing feed quality
- Reduced-lignin % (ADL, acid detergent lignin) content of 22% less than the average of competitive check varieties gives WL 375HVX.RR a 16% greater RFQ (relative forage quality), and a 18% greater NDFD (neutral detergent fiber digestibility) than the average of competitive check varieties
- Yield performance of WL 375HVX.RR rivals WL 372HQ.RR, our highest yielding dormant variety ever, across 4 of our major U.S. research facilities
- Superb yield potential and agronomic characteristics under 4-cut system if delaying cutting frequency, or under 5- to 6-cut systems to maximize increased feed value
- Perfect Disease Resistance Index (40/40), which includes 'High Resistance' to Aphanomyces Race 1, Race 2, AND Race 3; and includes multi-race resistance to Anthracnose
- WL 375HVX.RR contains Roundup Ready® Technology for unsurpassed broad spectrum weed control and crop safety to maximize seedling survival at establishment and provide a useful tool on established stands
- Well-adapted for Midwest, Northeast, Central, Northern, and Southern Plains, as well as Intermountain Regions and Pacific Northwest; ideally-suited for on-farm dairy, beef or cash hay producers
- WL 375HVX.RR delivers quick recovery for frequent harvest schedules under intense management
- Quick stand establishment with WL 375HVX.RR that comes fully-loaded with W-L's Gold Treatment PLUS containing Stamina® and Take-Off® seed treatments



Planting WL 375HVX.RR utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Exceptional weed control at both stand establishment and in established stands means fewer weeds and higher-quality hay and haylage
- Exceptional crop safety at all growth stages with the Roundup Ready® weed control system
- Recommended first glyphosate application at 1st-3rd trifoliate stage to provide early weed control on new seedlings and lower seedling mortality
- The simplicity of using a single herbicide (Roundup®) provides superior weed control with no need to tank mix
- Flexibility in timing of application allows growers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding

*Results are based on controlled field trials at the listed W-L Research location. Results may vary and are dependent on factors outside of W-L Research's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Research.

WL ALFALFAS BETTER SEED THROUGH RESEARCH

HARVXTRA with Roundup Ready® Technology

WL ALFALFAS

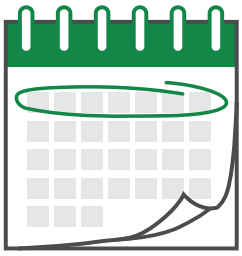
W-L HarvXtra® Alfalfa varieties give you unmatched flexibility, and fall dormancy options offered by no other brand.

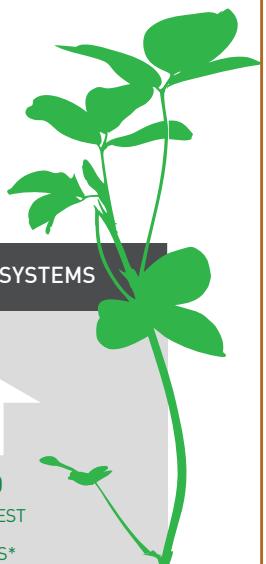
Farmers can maintain a **NORMAL HARVEST SCHEDULE** and achieve **HIGHER QUALITY**

OR **CHOOSE TO DELAY HARVEST FOR UP TO**

7-10 DAYS **FOR HIGHER YIELD POTENTIAL WITHOUT SACRIFICING QUALITY**

Compared to conventional alfalfa at the same stage of maturity.





WL 341HVX.RR — FD4 — FIELD-PROVEN BENEFITS UNDER 3-4 CUT SYSTEMS

23%	28%	25%	Up to 25%
LESS LIGNIN (acid detergent lignin) across cuttings and locations	**HIGHER RFQ** (relative forage quality) across cuttings	**HIGHER NDFD** (neutral detergent fiber digestibility) across cuttings	**HIGHER YIELD** WITH DELAYED HARVEST AT 35-DAY CUTTING INTERVALS*

*Three cuttings at 35-day intervals compared to four cuttings at 28-day intervals, with the three-cut system yielding 26% more over the life of the stand.

WL 375HVX.RR — FD5 — FIELD-PROVEN BENEFITS UNDER 4-5 CUT SYSTEMS

22%	18%	16%	Up to 25%
LESS LIGNIN (acid detergent lignin) across cuttings and locations	**HIGHER RFQ** (relative forage quality) across cuttings	**HIGHER NDFD** (neutral detergent fiber digestibility) across cuttings	**HIGHER YIELD** WITH DELAYED HARVEST AT 35-DAY CUTTING INTERVALS*

*Three cuttings at 35-day intervals compared to four cuttings at 28-day intervals, with the three-cut system yielding 26% more over the life of the stand.

NOTE: Data comes from FGI trials comparing WL 341HVX.RR and WL 375HVX.RR, the HarvXtra® Alfalfa with Roundup Ready® Technology varieties to commercial checks. Trials were harvested in 2014 - 2017 from Boone, IA; West Salem, WI.; and Mt. Joy, PA. Yield increase is directly correlated to the ability to delay harvest. Due to factors outside of Forage Genetics International's (FGI) control, such as weather, crop production patterns, and other factors, results to be obtained, including but not limited to yields or financial performance, cannot be predicted or guaranteed by FGI. Results are based upon FGI controlled tests and field trials and public trials. Results may vary.

LEARN MORE AT WLALFALFAS.COM

HARVXTRA with Roundup Ready® Technology

Clovers

Clovers are widely adapted legumes that improve forage production in several ways. They increase protein and mineral content of pastures, hay, and silage. Clovers can tolerate a wider range of soils and growing conditions than alfalfa. Most clovers can tolerate lower pH soils as well as poor drainage. Clovers mix well with many forage grasses, but can also be grown in pure stands. Clovers can be used for improving soil health, conservation, and honey production. The following section will help you place the right clover on your farm.

Medium Red Clover

Plant type: Perennial Legume
Planting dates: Jan–April or Aug–Sept
Soil pH: 6.0–7.0
Soil adaption: Well drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 272,000
Seeding rate: 10–12 lbs/A
2–6 lbs/A mix

Days to germination: 7–12
Main usage: Pasture, hay, pasture renovation, soil improvement
Height at maturity: 24”–36”
Length of stand: 1–4 years
Reproduces by: Seed
Pounds per bushel: 60
Precautions: Bloat Potential

Suggested seeding rates for red clover seeded in a mixture or alone with single grass	
Species	lbs/A of medium red clover
Red clover alone	8–12
Timothy	4–6
Orchardgrass	4–6
Perennial ryegrass	4–8
Smooth bromegrass	6–8
Reed canarygrass	6–8
Tall fescue	4–6

RED CLOVER Gallant
A Superior Variety

- Premium red clover only available from *CISCO*
- 3-4 year stand life
- Extremely high yielding with exceptional stand persistence
- Great disease package improves stand persistence
- Improves pastures with nitrogen production and improving protein content
- Coated seed; frost seeds well

Gallant Red clover is a modern, Midwest-bred red clover. It has been selected for high yield, stand persistence, and a strong disease package. The trait that leads to persistence is its unmatched black patch resistance. Gallant is also resistant to northern and southern anthracnose and is also resistant to powdery mildew. Gallant can produce high yields well into years three and four. It has been the leader in yield at The Ohio State variety trials. Gallant Red clover is a real return on investment for top forage producers. Notice in the below data the tremendous yield and persistence (% stand) compared to other varieties.

Red Clover Variety Trial
Ohio, South Charleston, Sown 4/9/2013

Variety	28-May	2-Jul	8-Sep	2015	2014	2013	2013-14	% Stand
	---------- Tons Dry Matter/A ----------							9/18/2015
Gallant	1.95	1.16	1.14	4.45	6.43	2.91	13.53	83
RC0401*	1.82	0.87	0.98	3.63	6.24	3.08	12.93	66
FSG 402	1.76	0.80	0.73	3.18	6.26	2.98	12.53	69
PGI 44	1.76	0.82	0.72	3.25	6.14	2.91	12.34	71
Common red	0.92	0.50	0.07	1.32	4.27	2.55	8.41	4
Mammoth red	0.70	0.33	0.12	1.29	4.56	1.86	7.59	4
Mean	1.48	0.74	0.63	2.85	5.65	2.72	11.22	50
LSD	0.57	0.29	0.33	1.00	1.09	0.49	2.15	21.6
Prob > F	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.0001
CV	25.5	26.0	34.8	23.0	12.9	12.0	12.7	28.9

* Variety tested using experimental seed that may not give performance identical to that of commercially available seed.

Establishment: Seeded with a Hege 3-point hitch drill with presswheels at 12 lb/a.

Plot size: 4' x 20' , 7' alleys and borders, RCBD with four reps.

Soil type/ analysis: Crosby silt loam, pH=7.0, P=48 lbs/a, K=216 lbs/a, CEC=12.7, O.M.=1.8,(10/13).

Star Fire II

- High yielding improved variety
- Strong disease package with proven persistence
- Capable of 3-4 harvests per year

Disease/Insect/Nematode Ratings	
Bacterial wilt	HR
Northern anthracnose	TBD
Aphanomyces race I	HR
Fusarium wilt	HR
Phytophthora root rot	HR
Southern anthracnose	HR

Comparative Performance Data	
Variety	% yield of StarFire II
StarFire II	100%
Cinnamon Plus	97%
Kenland	91%
Marathon	86%
VNS Med Red	75%

Common Medium Red Clover

- Short lived perennial forage legume
- Great for green manure, plowdown, & cover crop
- Frost seeds well
- Available as coated or uncoated seed
- Coated seed recommended for frost seeding

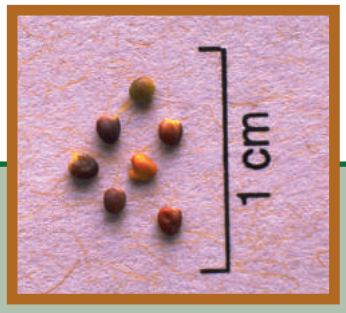
Mammoth Red Clover

Plant type: Biennial, weak perennial
Planting dates: Jan–April or Aug–Sept
Soil pH: 5.5–7.0
Soil adaption: Well drained, poor soils
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 272,000
Seeding rate: 10–12 lbs/A
2–6 lbs/A mix

Days to germination: 7–10
Main usage: Soil improvement, plowdown
Height at maturity: 36”–48”
Length of stand: 1–2 years
Reproduces by: Seed
Pounds per bushel: 60
Precautions: Bloat Potential

Mammoth red clover, or single-cut clover, is not as desirable for hay or pasture as medium red clover because of its coarse stems. However, its vigorous growth (it grows taller than medium red clover) and maturity (10 days to two weeks later than medium red clover) makes it a good choice for soil improvement. Mammoth red clover has been widely used as a plow-down or cover crop with sweet clover to build organic matter in the soil and provide nitrogen to the following crop. Mammoth red clover can be frost seeded into winter wheat.

Alsike Clover



Plant type: Perennial Legume
Planting dates: Jan–April or Aug–Sept
Soil pH: 6.0–6.5
Soil adaption: Poorly drained, medium fertility
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 728,000
Seeding rate: 6–8 lbs/A
1–2 lbs/A mix

Days to germination: 7–10
Main usage: Hay, pasture
Height at maturity: 12”–36”
Length of stand: 2–3 years
Reproduces by: Seed
Pounds per bushel: 60
Precautions: Bloat potential, photo sensitivity, not for horses, slow drying for hay

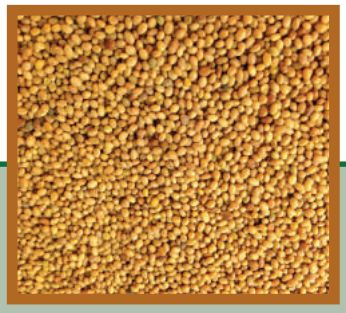
Adapted to the same general area as red clover. Alsike clover makes a very palatable, high-quality hay when planted with other clovers and grasses, especially timothy. Alsike produces high quality pasture and hay. It prefers a heavy, moist soil and will do better than other clovers on poorly drained acid soils. Alsike clover does not do well in light, sandy soils.

Aurora

- Adapted to similar areas as red clover
- Grows on wide range of heavier soils
- Can tolerate standing water for 7-14 days
- Deep branched taproot
- Great winterhardiness

CAUTION: Alsike clover has a tendency to cause bloat and should be fed to livestock with care. On pasture high in alsike clover content, take steps to introduce animals gradually to the forage to reduce bloat potential. It has also been implicated as causing “alsike clover poisoning” in horses. Alsike-induced photosensitization has been reported among animals grazing alsike clover. This will occur in bright, sunny weather and causes a reddening of the skin and swelling of the affected areas in horses.

Crimson Clover



Plant type: Annual Legume
Planting dates: Aug–Sept
Soil pH: 4.8–8.2
Soil adaption: Adapted to wide variety of soils as long as soil is well drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 150,000
Seeding rate: 20 lbs/A
8–10 lbs/A mix

Days to germination: 7–10
Main usage: Hay, pasture, soil improvement, cover crop
Height at maturity: 24”–36”
Length of stand: Weak biennial
Reproduces by: Seed
Pounds per bushel: 60
Precautions: Bloat potential

Crimson clover is an overwintering annual usually grown as a cover crop that is best seeded after wheat. When planting, be sure to allow six to eight weeks of growth before a freeze. Crimson clover can be grazed or hayed in the spring. This species is known for its fine, fibrous root system, shade tolerance, and quick establishment.

AU Robin

- Improved crimson clover variety
- Earlier maturing than VNS crimson clover
- Can produce up to 140 lb/A of nitrogen (N)
- Quick growing

Dixie

- Reseeding variety
- Can reach 2.5' in height
- Fine, fibrous root structure
- Available as coated or raw seed

White Cloud

- First white crimson clover
- Exhibits faster growth and increased forage yield
- Improved nitrogen (N) production
- Available coated seed only

KY Pride

- Outstanding cold tolerance
- Late maturity with improved forage yields
- Great in cover crop mixes as well as pollinator mixes
- Rapid regrowth after harvest

Ladino Clover

Plant type: Perennial Legume
Planting dates: Feb–April or Aug–Sept
Soil pH: 5.8–6.5
Soil adaption: Wide
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 800,000
Seeding rate: 4–6 lbs/A
0.5–2 lbs/A mix

Days to germination: 7–10
Main usage: Hay, conservation, pasture, wildlife
Height at maturity: 15”–36”
Length of stand: 2–5 years
Reproduces by: Seed and stolons
Pounds per bushel: 60
Precautions: Bloat potential, slow drying as hay

The white clovers, *Trifolium repens L*, found in the United States are generally found in one of three different ecotypes. The smallest is wild white clover. Generally, this is a native clover. The common white clover found in yards and pastures, as well as White Dutch clover, are usually in the intermediate sized group. The largest white clovers are often called ladino clovers. Ladino clovers are usually used in pastures. White clovers grow on a wide range of soil pH, drainage, and topography. Ideally, it likes cool, moist growing conditions. It should be mixed with grasses to lower bloat potential. White clover can tolerate more grazing pressure than other clovers and frost seeds very well.

Jumbo II

- Fast growing, high yielding
- Great forage quality
- Very large leaves, up to three inches in optimal conditions
- Excellent regrowth

Will

- Persistent in hot climates, but also very winterhardy
- Excellent stolon production
- Great yield potential

Advantage

- Great for pastures or wildlife plots
- Remains in a vegetative state during whitetail deer antler growth
- High crude protein content with large, succulent leaves
- Early vigor and hardiness
- Bred under grazing pressure

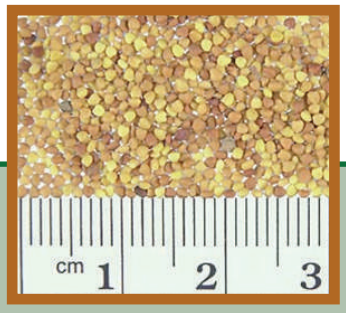
Pinnacle

- New, advanced variety
- Upright growth combined with vigor
- Fine stems and dark, green leaves
- Bred for superior persistence with good leaf disease tolerance

Common Ladino Clover

- Great legume for pastures
- Provides nitrogen and protein content to a pasture
- Spreads with stolons
- Tolerates close grazing
- Very large leaves
- Available coated or raw

White Clover



Plant type: Perennial Legume
Planting dates: Feb–April or Aug–Sept
Soil pH: 5.5–7.0
Soil adaption: Wide
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 768,000
Seeding rate: 3–5 lbs/A
0.5–2 lbs/A mix

Days to germination: 7–10
Main usage: Soil improvement, pasture, wildlife
Height at maturity: 3”–24”
Length of stand: 2–10 years
Reproduces by: Seed and stolons
Pounds per bushel: 60
Precautions: Bloat hazard, slow drying as hay

Kopu II

- Persistent, grazing tolerant for season-long production
- High stolon density
- Large leaves
- Has higher levels on nonstructural carbohydrates than other white clovers

Durana

- Low maintenance pasture improvement
- Extremely persistent under grazing conditions
- Best used to improve cool-season pastures
- Grazes best in spring, early summer, and fall

New Zealand

- Highly palatable white clover
- Yields are greatest in mild, humid climates
- Best adapted to well drained, silt loam and clay soils

Super Haifa

- Superior heat tolerance
- Well fit for all types of livestock
- Great seedling vigor, productivity, and persistence

White Dutch

- Commonly used in lawns as ground cover
- Great for use in plant nurseries between the rows
- Also works in pastures
- Small leaves, low growing

Annual Clover

Plant type: Annual Legume
Planting dates: April-August
Soil pH: 6.0–7.5
Soil adaption: Moderate to well drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 130,000 (coated)
Seeding rate: 8–15 lbs/A
3–6 lbs/A mix

Days to germination: 7
Main usage: Cover crop, nurse crop, pasture, hay, wildlife
Height at maturity: 18”–30”
Length of stand: 6 months or less
Reproduces by: Seed
Pounds per bushel: 60

Berseem Clover

- Great companion with alfalfa to improve yield and forage quality
- Will tolerate temperatures down to 5F
- Works well after wheat in a cover crop mixture
- Hollow stems help with quick hay drying
- Contains tannins that prevent bloat in livestock

FROSTY Berseem Clover

Annual Clover

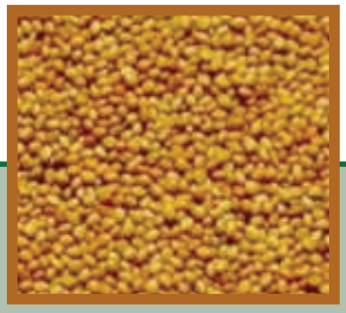
Plant type: Annual Legume
Planting dates: April-October
Soil pH: 4.5–8.5
Soil adaption: Moderate to well drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 500,000 (coated)
Seeding rate: 8–15 lbs/A
3–6 lbs/A mix

Days to germination: 7
Main usage: Cover crop, nurse crop, pasture, hay, wildlife
Height at maturity: 18”–30”
Length of stand: 6 months or less
Reproduces by: Seed
Pounds per bushel: 60

Balansa Clover

- Adaptable across a wide range of soils
- Great for cover crop or a forage
- Can be seeded later in the fall than crimson clover at a lower seeding rate
- Works well with cereal rye

Sweet Clover



Plant type: Biennial Legume
Planting dates: January–April
Soil pH: 6.5–7.5
Soil adaption: Wide
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 250,000
Seeding rate: 10–15 lbs/A
2–6 lbs/A mix

Days to germination: 7–10
Main usage: Soil improvement
Height at maturity: 24”–60”
Length of stand: 2 years
Reproduces by: Seed
Pounds per bushel: 60
Precautions: Soybean stem nematode host, not for hay or pasture

Yellow Blossom

- Soil builder, legume
- Can improve soil drainage with large, vigorous tap root
- Good food source for honey bees and beneficial predatory wasps
- Matures 10-14 days earlier than white blossom sweet clover
- Do not use for hay, pasture, or silage

White Blossom

- Soil builder, legume
- Prefers well drained soil
- Can improve soil drainage with large, vigorous tap root
- Good food source for honey bees
- Produces lighter colored honey than yellow blossom sweet clover
- Matures 10-14 days later than yellow blossom sweet clover
- Do not use for hay, pasture, or silage

Plowdown Clover Mixes

Plant type: Annual/Biennial Legume
Planting dates: January–May
Soil pH: 6.5–7.0
Soil adaption: Wide
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 260,000
Seeding rate: 10–12 lbs/A

Days to germination: 7–10
Main usage: Soil improvement
Height at maturity: 24”–48”
Pounds per bushel: 60
Precautions: Soybean stem nematode host, not for hay or pasture

Plowdown Clover Mixes

- Can produce over 100 lb/A of nitrogen (N) for following crops
- Improves soil drainage and water percolation
- Increases organic matter, improves tilth and soil structure
- Works well frost seeded into wheat
- Great cover crop once the wheat is harvested
- **80/20 Plowdown** is 80% Mammoth red clover and 20% Yellow Blossom sweet clover
- **60/40 Plowdown** is 60% Mammoth red clover and 40% Yellow Blossom sweet clover

Coated vs. Raw or Preinoculated Seed?

Benefits of Coated Seed:

- Ensures Nodulation–The coating material surrounds each seed with a rich concentration of specifically isolated strains of rhizobia to ensure nodulation.
- Protects Seed Germination Zone–The coating material protects the rhizobia from damage by fertilizer salts for longer periods than other methods in order to mix seed and fertilizer and broadcast them together.
- Improves Seedling Emergence-The hygroscopic qualities of the coating material pulls moisture to the seed and is especially beneficial in dry soils and shallow planted seed.
- More Uniform Stands– The added weight and density increase the uniformity and distance that seed can be spread with a spin type seeder.
- Potential for Highest Yields-The coating can increase yields by assisting with quick nodulation and providing specific strains of rhizobium for maximum efficiency.
- More Plants Per Pound of Seed-The additional surviving plants from coated seed more than offsets the seed loss from the weight gain of the coating material.
- Increases Survivability 50% or More-Because of its added bulk, the coating material is able to hold larger numbers of rhizobia while also increasing their likelihood of surviving.
- High Concentration of Rhizobia Bacteria-The coating provides a micro-environment for quick growth of the rhizobia by putting calcium carbonate and other growth encouraging materials in the coating.

Birdsfoot Trefoil

Plant type: Perennial Legume
Planting dates: March–April or Aug–Sept
Soil pH: 5.5–7.0
Soil adaption: Poorly drained, low pH soils
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 400,000
Seeding rate: 6–12 lbs/A
3–5 lbs/A mix

Days to germination: 14
Main Usage: Pasture, hay
Height at maturity: 2’–4’
Length of stand: 4–8 years
Reproduces by: Seed
Pounds per bushel: 60
Precautions: Requires inoculant

Birdsfoot trefoil is a perennial forage legume that is well adapted to the north-central states. It can be used for both pasture and hay production. However, most of the hay production is as baleage or silage. BFT is well adapted to poorly drained or acidic soils. It should be strongly considered in areas where alfalfa cannot be grown; however, it will not tolerate extended periods of standing water. BFT requires good management to reach its full potential. It requires a rest period of 40-45 days between harvests and some leaf area must be left to encourage regrowth. An ideal stubble height is 4.5”. Another interesting trait of BFT is that livestock will not bloat on it, unlike other forage legumes. Trefoil also maintains forage quality from first bloom through seed production. This provides a longer harvest window. It can be slow to establish, but once established, it will provide for a lifetime. The different varieties of trefoil have different growth characteristics, which are important to variety selection.

Norcen

- Semi-upright to upright variety
- Good dual purpose hay and pasture
- Exhibits good yields
- Maturity falls between Empire and Viking
- Most winter-hardy trefoil available

Pardee

- Upright variety
- Good for hay production
- Excellent recovery and regrowth after harvest
- High disease tolerance
- High yielding

Leo

- Semi-upright to upright variety
- Good dual purpose hay and pasture
- Early spring growth
- Very good seedling vigor
- Produces the majority of its yield earlier in the season

Viking

- Upright variety
- Earliest maturing trefoil
- Great for hay production
- Moderate winterhardiness

Empire

- Prostrate growth
- Late maturing, great for pasture
- Very fine stemmed
- Tolerates wet soil very well
- Moderate winterhardiness and seedling vigor

Crown Vetch

Plant type: Perennial Legume	Days to germination: 14+
Planting dates: April–May or Aug–Sept	Main Usage: Ground cover, stabilization
Soil pH: 5.5–7.0	Height at maturity: 1'–2'
Soil adaption: Wide	Length of stand: Long
Planting depth: 1/4"–1/2"	Reproduces by: Seed, rhizome
Approximate seeds/lb: 98,000	Pounds per bushel: 60
Seeding rate: 10–25 lbs/A 5–10 lbs/A mix	Precautions: Invasive, must inoculate, not intended for animal consumption

Crown Vetch

- Good legume for soil conservation
- Grows in low fertility, low pH areas
- Low maintenance once established
- Can become invasive if left uncontrolled

Hairy Vetch

Plant type: Biennial Legume	Days to germination: 7–10
Planting dates: March–May or Aug–Sept	Main Usage: Pasture, hay, silage
Soil pH: 6.6–7.2	Height at maturity: 15”–24”
Soil adaption: Well drained, high fertility	Length of stand: 3–7 years
Planting depth: 1/8”–1/4”	Reproduces by: Seed
Approximate seeds/lb: 16,000	Pounds per bushel: 60
Seeding rate: 18–20 lbs/A 8–15 lbs/A mix	Precautions: Normally contains hard seed and can emerge in the future

Vallana

- Improved variety of hairy vetch
- Excellent winterhardiness
- Can produce 60-120 lb/A of nitrogen (N)
- Best fall seeded
- A unique plant breeding breakthrough with virtually 0% hard seed

Common Hairy Vetch

- Excellent source of nitrogen (N) as a cover crop
- Used as a forage legume in pastures in cool, moist environments
- Moderate winterhardiness

Amoreiras

- Low growing cover crop hairy vetch
- Great nitrogen (N) producer
- Establishes quickly and covers the ground

Korean Lespedeza

Plant type: Annual Legume
Planting dates: March–May or Aug–Sept
Soil pH: 6.6–7.2
Soil adaption: Well drained, high fertility
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 238,000
Seeding rate: 25–35 lbs/A
8–15 lbs/A mix

Days to germination: 7
Main Usage: Pasture, hay, silage
Height at maturity: 15”–36”
Length of stand: 3–7 years
Reproduces by: Seed
Pounds per bushel: 25

Korean lespedeza is commonly used for wildlife food and cover, forage, cover or nurse crop as well as temporary cover for erosion. Korean lespedeza is the earliest germinating of the annual lespedezas, providing the earliest grazing of any lespedezas. It should be grazed or cut when it reaches the half bloom stage. All harvesting methods should leave a 3” stubble. It is a reseeding annual that reaches full bloom in late summer when the growth rate rapidly declines. The reason for its popularity is due to what it can do on poor soils. It will grow well on acidic soils with low fertility and can survive both drought and flood. It is a good companion with bunch type grasses, such as timothy, orchardgrass, and tall fescue. It provides much needed summer grazing when cool-season grasses are dramatically slower at biomass production. As with all legumes, it is important to inoculate with the correct species of rhizobial bacteria.

Korean Lespedeza

- Annual legume mostly used for wildlife food plots
- Can be used as a forage, temporary ground cover, or a cover crop
- Grows well on acidic, low fertility soils
- Matches with bunch grasses such as orchardgrass, timothy, and tall fescue

Winter Peas

Plant type: Annual Legume
Planting dates: Aug–Sept
Soil pH: 6.0–7.0
Soil adaption: Wide range of soils
Planting depth: 1/2”–1”
Approximate seeds/lb: 3,500
Seeding rate: 30–50 lbs/A
20–40 lbs/A mix

Days to germination: 7–10
Main Usage: Wildlife, cover crop, green manure plowdown
Height at maturity: 2’–4’
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 60

Austrian Winter Peas

- Cold tolerant, viney, annual legume
- Great for cover crop and wildlife plots
- More cold tolerance than Canadian field peas
- Can produce 60-120 lb/A nitrogen (N) and yield 1-2 t/A forage yield
- Can survive down to 20°F
- Needs to be inoculated and drilled
- Large fan root structure adds organic matter to soil

Frostmaster Peas

- Long vined winter forage pea
- Higher yielding than Austrian winter peas
- White flowered, absence of tannins (bitter tasting compound)
- Sweet in taste, more palatable than Austrian winter peas
- Need to be inoculated and drilled
- Cold tolerant

Icicle Peas

- Exceptional forage yield with white flowers
- Low in tannins for improved animal performance
- Late flowering to match maturity of oats or triticale
- Great as a forage or cover crop

Spring Peas

Plant type: Annual Legume
Planting dates: March–April or Aug–Sept
Soil pH: 6.0–7.0
Soil adaption: Wide range of soils
Planting depth: 3/4”–1”
Approximate seeds/lb: 3,500
Seeding rate: 40–80 lbs/A
30–40 lbs/A mix

Days to germination: 7–10
Main Usage: Wildlife, cover crop, green manure plowdown
Height at maturity: 2’–4’
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 60

Stockade

- Improved field pea, leafier
- Spring-planted field pea
- Work well with cereal grains, such as oats or triticale for a forage crop
- Also used as a cover crop
- Need to be inoculated and drilled

Cowpeas

Plant type: Annual Legume
Planting dates: May–August
Soil pH: 6.0–7.0
Soil adaption: Wide, 60° or warmer soil temperature
Planting depth: 1/2”–1”
Approximate seeds/lb: 1,600-4,300
Seeding rate: 30–90 lbs/A

Days to germination: 7–10
Main Usage: Pasture, cover crop, silage
Height at maturity: 3’–4’
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 60

Cowpeas

- Warm season annual legume similar to soybeans
- Grows well in dry, hot conditions
- Mix with sorghum sudangrass for pasture or silage
- One harvest crop
- Inoculate to enhance nitrogen (N) production
- Produces 70 – 150 lb/A N
- Great wildlife crop

COWPEAS WITH SORGHUM SUDANGRASS

Forage Grasses

Forage grasses are a staple in forage based livestock production. Grasses fit a wide range of soils, fertility, and livestock. They provide energy as well as the dietary fiber needed by livestock. Grasses need supplemental nitrogen (N) to reach their full yield potential. This can be achieved with commercial fertilizer or the addition of a legume. Grass can increase yields in a legume forage stand. It is important to match the forage grass to your farm and livestock situation.

Orchardgrass

Plant type: Perennial Grass
Planting dates: April–May or Aug–Sept
Soil pH: 5.8–8.2
Soil adaption: Well drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 416,000
Seeding rate: 10–15 lbs/A
2–5 lbs/A mix

Days to germination: 18–22
Main usage: Hay, pasture
Height at maturity: 24”–40”
Length of stand: 8–10 years
Reproduces by: Seed
Pounds per bushel: 14

Orchardgrass is a bunch grass that exhibits reproductive growth of 2-4’ in height and vegetative growth from 6-18”. It is well adapted to most Midwestern farms because of its high yield, drought tolerance, shade tolerance, and winterhardiness. It matches well with most forage legumes, such as alfalfa, red clover, and birdsfoot trefoil. Orchardgrass can produce high quality, high yielding feed if harvested in a timely fashion (ideally late boot stage to early bloom). If it is harvested in seed production, the forage quality drops rapidly.

Profit

- Late maturity, matches well with alfalfa and other legumes
- Excellent disease package, especially resistant to leaf rust
- Ideal for hay or pasture production
- Best summer performance of any orchardgrass

Tekapo

- New Zealand type grazing orchardgrass
- Exhibits very low crown and dense prostrate growth that tolerates grazing well
- Long, soft leaves provide very palatable feed
- Med-late maturity, matches well with alfalfa and other legumes
- Ideal for pasture as well as hay production

Devour

- Tolerant to grazing, withstands grazing pressure
- Quick establishing because of good seedling vigor
- Late maturing, matches up with alfalfa or red clover
- Works well for hay
- High yielding

Endurance

- Grazing type orchardgrass with lowest crowns
- Medium maturity
- Germplasm selected under grazing
- High yielding

Echelon

- Very late maturing orchardgrass
- Heat tolerant
- Great as hay or pasture
- Good winterhardiness

Crown Royale

- Late maturing, high yielding orchardgrass
- Great resistance to leaf diseases and rusts
- Profuse tillering

Late Mate II

- One of the latest maturing orchardgrass blends available
- Matches very well with alfalfa
- Great for hay production
- Dependable performance

Potomac

- Older, more economical variety
- Early maturing orchardgrass that does not match well with legumes
- Very high yielding in monocultures

CISCO SEEDS
A Division of The CISCO Companies

Forage Tall Fescues

Plant type: Perennial Grass	Days to germination: 10–12
Planting dates: March–May or Aug–Sept	Main usage: Pasture, hay, stockpiling
Soil pH: 5.0–8.0	Height at maturity: 24”–40”
Soil adaption: Wide, dry-wet	Length of stand: 10+ years
Planting depth: 1/8”–1/4”	Reproduces by: Seed, short rhizomes
Approximate seeds/lb: 227,000	Pounds per bushel: 25
Seeding rate: 10–30 lbs/A 10–15 lbs/A mix	Precautions: KY-31 Endophyte Fungus, KY-31 not recommended for grazing animals

Tall fescue is a relatively deep-rooted bunch grass found throughout much of the United States. It can tolerate a wide range of soils and fertility. It matches well with forage legumes, especially red and ladino clover. KY-31 tall fescue makes up 75% of all tall fescue grown. Under proper management it can be a productive and profitable grass. However, with new low endophyte varieties, other tall fescues should be considered. The endophyte found in KY-31 is a fungus that grows between the plant cells and makes it tough, but it also reduces animal performance and causes animal health problems in extreme cases. KY-31 is not recommended for horses. All other low endophyte or friendly endophyte tall fescues are safe for horses or livestock.

Payload

- Medium maturing tall fescue that heads approximately two days later than KY-31
- High yielding due to aggressive growth and large crown size
- Low endophyte for improved animal performance
- Yield leader with great stem rust resistance

Bronson

- Low endophyte tall fescue
- Exhibits high yield and toughness associated with tall fescue
- Persistent
- Soft, palatable leaves
- Best animal acceptance per Penn State University grazing trials

Martin II/Protek

- Early-medium tall fescue with Novel Endophyte
- High yielding forage that is more heat and drought tolerant than endophyte free tall fescues
- Improves pastures and hay as compared to KY-31 tall fescue
- Stockpiles well

Martin II

- Low endophyte tall fescue
- Early flowering with high seedling vigor
- Great in hay or pasture situations
- Extended stay-green forage production during mild summers
- Relatively drought tolerant

Bull

- Low endophyte tall fescue
- Matures about a week earlier than KY-31
- Lowest lignin tall fescue available
- Soft leaves
- Great for hay or pasture

Fawn

- Low endophyte tall fescue
- Low maintenance
- Very drought tolerant
- Best for forage when plants are young
- Popularly priced

Kentucky-31

- Endophyte infected tall fescue
- Extremely drought tolerant and tough
- Can be stockpiled
- Good for waterways and other conservation practices
- Not advised to use for grazing animals unless diluted with clover and not grazed when hot and dry

Smooth Bromegrass

Plant type: Perennial Grass
Planting dates: April–May or Aug–Sept
Soil pH: 6.0–7.5
Soil adaption: Well drained, fertile
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 140,000
Seeding rate: 15–20 lbs/A
3–8 lbs/A mix

Days to germination: 14
Main usage: Hay, pasture
Height at maturity: 36”–48”
Length of stand: 10+ years
Reproduces by: Seed and rhizomes
Pounds per bushel: 14

Smooth bromegrass is a sod forming, long-lived perennial forage grass. It does well in a 2-3 cut system, and is very winterhardy and drought tolerant. It spreads by seed and rhizomes. It mixes well with birdsfoot trefoil and clovers. Smooth bromegrass makes deep blue green, soft hay. It is also found in many northern pastures. It is a large chaffy seed that may cause problems going through the seed box of a grain drill.

Smooth Bromegrass

- Long-lived sod forming forage grass
- Late maturing grass that matches well with birdsfoot trefoil
- Maintains forage quality up to seed production

Lakota Prairie

- Improved native prairie bromegrass
- Selected for winterhardiness and resistance to powdery mildew
- Adapted to northern climates
- Large, soft leaves
- For maximum persistence, must be allowed to reseed itself in late summer

Meadow Bromegrass

Plant type: Perennial Grass
Planting dates: April–May or Aug–Sept
Soil pH: 6.0–7.5
Soil adaption: Well drained, fertile
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 93,000
Seeding rate: 15–20 lbs/A
3–8 lbs/A mix

Days to germination: 14
Main usage: Hay, pasture
Height at maturity: 36”–48”
Length of stand: 10+ years
Reproduces by: Seed and rhizomes
Pounds per bushel: 14

Meadow bromegrass is a cool-season perennial grass with short rhizomes. It is very palatable to all types of livestock because of its large, soft leaves. It has excellent winterhardiness with moderate tolerance to shade. It can be grown for hay or pasture and mixes well with legumes such as alfalfa.

MacBeth

- Tremendous growth during cool, moist conditions
- Early spring growth
- Very palatable and high yielding
- Top-yielding with rapid regrowth
- Works well with alfalfa
- Topped several university trials

AC Admiral

- Winterhardy bunch grass with an extensive fibrous root system
- Excellent forage quality and yield
- Well suited for hay or grazing
- Out yields smooth bromegrass

Meadow Fescues

Plant type: Perennial Grass
Planting dates: March–May or Aug–Sept
Soil pH: 6.6–7.2
Soil adaption: Well drained, high fertility
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 220,000
Seeding rate: 18–20 lbs/A
3–5 lbs/A mix

Days to germination: 7
Main usage: Pasture, hay, silage
Height at maturity: 15”–36”
Length of stand: 3–7 years
Reproduces by: Seed
Pounds per bushel: 22

Meadow fescue is a grass that was introduced to the United States and Canada in the early 1800’s. Meadow fescue works well in managed intensive grazing situations and is a good choice for hay production, where “winter kill” is an issue. Meadow fescue performs well under drier conditions for making hay or silage. Although meadow fescues do contain endophytes, they are at very low levels, and show no signs of having detrimental effects on livestock. Plant at a rate of two to three pounds per acre with alfalfa.

Preval

- Good forage yield with improved disease resistance
- Extremely winterhardy
- Well fit to rotational grazing
- Suitable for hay and grazing
- Long, wide leaves

Annual Ryegrass

Plant type: Annual Grass
Planting dates: Feb–May or Aug–Oct
Soil pH: 5.6–6.2
Soil adaption: Well-moderately drained, med-high fertility
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 227,000
Seeding rate: 20–35 lbs/A
10–20 lbs/A mix

Days to germination: 5–7
Main usage: Pasture, winter cover crop
Height at maturity: 12”–24”
Length of stand: 1–2 years
Reproduces by: Seed
Pounds per bushel: 24
Precautions: Can be considered invasive

Annual ryegrass is quick establishing and capable of producing high forage yields in a short period of time. It is a very competitive winter annual cool-season grass that works well as a cover crop, forage, and erosion control. *CISCO* has gone to great lengths to ensure you will be provided with top winterhardy varieties of annual ryegrass. Do not use common varieties of annual ryegrass as a cover crop because they may not have adequate winterhardiness, may not have an adequate disease package, or may not break dormancy evenly in the spring.

Winterhawk

- Diploid annual ryegrass
- Above average disease resistance to crown rust and gray leafspot
- Extremely winterhardy
- Led The Ohio State University trials in yield and winterhardiness
- Consider supplemental nitrogen (N) if used for feed

Bruiser

- Diploid annual ryegrass
- Great disease resistance package
- Very winterhardy
- Good for high quality forage

Centurion

- Dual purpose cover crop and forage
- Deep rooted with great winterhardiness
- High yielding with improved forage quality
- Great disease resistance package

Lowboy

- Aggressive tillering to minimize bare soil
- Easy to terminate
- Deep rooted
- Good cold tolerance
- Stays low to the ground

Italian Ryegrass

Plant type: Annual Grass
Planting dates: Feb–May or Aug–Oct
Soil pH: 5.6–6.2
Soil adaption: Well-mod-well drained, med-high fertility
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 227,000
Seeding rate: 25–40 lbs/A
3–20 lbs/A mix

Days to germination: 5–7
Main usage: Pasture, green chop, haylage
Height at maturity: 12”–24”
Length of stand: 1–3 years
Reproduces by: Seed
Pounds per bushel: 24

Italian ryegrass is a short rotation ryegrass. During the seeding year the plant remains vegetative and will not produce seed heads. Once it overwinters, it will produce a seed head. It can be used as a spring forage crop, a double crop option, or as a cover crop. It can also be used to thicken an older alfalfa stand. Requires 50 lb/A of nitrogen (N) for first harvest and an additional 30-50 lb/A for each subsequent harvest.

Feast II

- Rapid establishment and growth
- High quality, high yielding forage
- Very palatable
- Start grazing at 10-12” in height and graze to 3-4” in height
- Make sure plants are firmly rooted before grazing begins
- May be used as a nurse crop for alfalfa establishment (2-3 lbs/A)

Tetraprime

- High forage yield with improved NDFd
- Selected for grazing tolerance
- Improved drought tolerance and winterhardiness
- Low aftermath seed head production

Perennial Ryegrass

Plant type: Perennial Grass
Planting dates: Feb–May or Aug–Oct
Soil pH: 5.6–6.2
Soil adaption: Wide
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 240,000
Seeding rate: 20–25 lbs/A
3–10 lbs/A mix

Days to germination: 7–10
Main usage: Pasture, hay
Height at maturity: 24”–36”
Length of stand: 3–5 years
Reproduces by: Seed
Pounds per bushel: 24

Perennial ryegrass is a high quality, high sugar content, cool-season grass. It is not as persistent as other forage grasses such as orchardgrass. It is not as winterhardy as smooth bromegrass. It performs very well under intensive grazing conditions and should be on a 21 to 25 day rotation. In general, perennial ryegrass needs to be grazed, chopped, or wet wrapped. It is a slow drying hay crop due to its high moisture content and thick, waxy cuticle.

Albion

- Most drought tolerant tetraploid perennial ryegrass available
- Utilized in Missouri as a KY-31 tall fescue replacement
- Late maturing tetraploid
- Bred for lower water requirements; as drought tolerant as orchardgrass
- Mixes well with legumes such as red and white clover
- Good fit for Midwestern grazers wanting a perennial ryegrass

Power

- Late maturing tetraploid variety
- Profuse tillering and rapid regrowth
- Less sensitive to drought and heat than many other varieties
- Excellent palatability/digestibility
- Wide succulent leaves
- Excellent rust resistance

TetraSweet

- Rapid growing tetraploid perennial ryegrass
- High energy, high digestibility
- Profuse tillering
- Late maturity
- Foliar disease resistant
- Excellent yield all season long

Respect

- Diploid perennial ryegrass
- Bunch type grass with intermediate maturity
- Remains productive on poorly drained soils
- Developed for improved regrowth, disease resistance, and yield

Festulolium

Plant type: Perennial Grass
Planting dates: March–May or Aug–Sept
Soil pH: 5.5–7.5
Soil adaption: Wide range of soils
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 210,000
Seeding rate: 35–40 lbs/A
3–15 lbs/A mix

Days to germination: 10
Main usage: Hay, pasture, grazing, silage
Height at maturity: 12”–30”
Length of stand: 3–7 years
Reproduces by: Seed
Pounds per bushel: 24

Festuloliums are a hybrid between a ryegrass (either annual, Italian, or perennial) and meadow fescue or tall fescue. It is a high sugar content perennial that is great for grazing or hay production. Festuloliums exhibit yields higher than perennial ryegrass, similar forage quality, and high disease resistance, persistence, and winterhardiness.

Perseus

- Cross between Italian ryegrass and meadow fescue
- Well suited for intermediate and late cutting
- Vigorous spring growth with rapid regrowth after harvest
- Works well during tough weather conditions

Spring Green

- Higher yielding than ryegrass during the summer
- Cold tolerant
- High forage quality
- Short rotation, high quality feed

Duo

- Cross between tetraploid perennial ryegrass and a meadow fescue
- Winterhardiness and persistence of a meadow fescue
- Forage quality of a perennial ryegrass
- Does not tolerate hot, dry conditions

Timothy

Plant type: Perennial Grass
Planting dates: March–May or Aug–Sept
Soil pH: 5.0–7.0
Soil adaption: Wide
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 1,200,000
Seeding rate: 10–12 lbs/A
1–4 lbs/A mix

Days to germination: 10–14
Main usage: Pasture, hay
Height at maturity: 24”–40”
Length of stand: 2–5 years
Reproduces by: Seed
Pounds per bushel: 45

Timothy is the oldest cultivated forage grass in North America. It is highly palatable as well as winterhardy. It performs best in cool, moist conditions. Timothy is well known and preferred in the horse market. It matches well with clovers or birdsfoot trefoil due to its late maturity. The following varieties offered are ranked in the order of maturity.

Kootenai

- Top of the line for yield and forage quality
- Matures three to five days earlier than Climax
- Very disease resistant and winterhardy
- Maturity matches well with alfalfa
- Consistent performance

Clair

- Matures about five days earlier than Climax
- Great first harvest yield
- Slow summer and fall growth

Tuukka

- Matures about three days earlier than Climax
- High leaf/stem ratio
- Good regrowth characteristics
- Can be mixed with alfalfa

Climax

- Medium-late maturity
- Most commonly used in hay mixtures
- Tall, fine-stemmed, good leaf production

Forage KY Bluegrass

Plant type: Perennial grass
Planting dates: March–May or Aug–Sept
Soil pH: 6.0–7.0
Soil adaption: Mod-well drained, Mod-high fertility
Planting depth: 1/4"–1/2"
Approximate seeds/lb: 2,177,000
Seeding rate: 15 lbs/A
2–10 lbs/A mix

Days to germination: 14–21
Main usage: Pasture, Hay
Height at maturity: 10"–18"
Length of stand: 3–7 years
Reproduces by: Seed, rhizomes
Pounds per bushel: 14

Kentucky bluegrass has been long utilized in pastures and hay fields in the Midwest. It should be mixed with other grasses. It is high in forage quality, matures early in the season, and tolerates close grazing.

Ginger

- Forage type bluegrass with wide leaves and relatively tall growth
- Well adapted for use in pasture
- Grows well in cooler weather
- Should be mixed with other forage grasses

Balin

- Very quick establishment
- Early maturing
- Good persistence & winter hardiness
- Tall growth for a bluegrass

Reed Canarygrass

Plant type: Perennial Grass
Planting dates: April–May or Aug–Sept
Soil pH: 5.5–8.2
Soil adaption: Wide, dry to very wet
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 480,000
Seeding rate: 8–12 lbs/A
2–4 lbs/A mix

Days to germination: 21–28
Main usage: Hay, conservation, pasture on wet ground
Height at maturity: 3’–8’
Length of stand: 10+ years
Reproduces by: Seed, rhizomes
Pounds per bushel: 47
Precautions: Can be considered invasive

Reed canarygrass is a tall sod forming grass that exhibits great tolerance to wet and flooded conditions, as well as excellent drought tolerance. It is of medium palatability and can quickly drop in forage quality as it matures. Reed canarygrass requires good management as to not allow it to spread to areas where it is undesired. Improved varieties are low in alkaloids, which in turn improves forage quality and intake. Reed canarygrass generally requires about 40 lb/A of nitrogen (N) per ton of forage.

Palaton

- Tall, leafy, high yielding
- Very persistent to foliar diseases
- Short rhizomes
- Very drought tolerant

Rival

- Great seedling vigor
- Low alkaloid improves animal performance
- Disease resistant
- Flood and drought tolerant

Enduro Plus Brand Forage Products

Enduro-Plus consists of only the best forage varieties available. All varieties in the Enduro-Plus product line have been developed and tested for forage quality, yield, and persistence. These products have been designed to give you higher relative feed values, which translates into more milk per acre, more beef per acre, or more energy for horses.

Milk Maker

Plant type: Annual Mix
Planting dates: March–April or Aug
Soil pH: 6.0–7.0
Soil adaption: Wide
Planting depth: 1”
Approximate seeds/lb: 8,000–9,000
Seeding rate: 100 lbs/A
70 lbs/A nurse crop

Days to germination: 7–10
Main usage: Baleage, silage, nurse crop
Height at maturity: 3’–5’
Length of stand: 1 cut
Reproduces by: Seed

50% Elevator Spring Triticale 50% Stockade Forage Peas

- Very versatile
- 60 days from emergence to harvest; best when triticale is in the boot stage
- High quality haylage for improved animal performance
- Great nurse crop for a forage seeding
- Fits well before or after a summer annual crop
- Tolerates frost or light freeze

Partner Pea/Oat Mix

Plant type: Annual Mix
Planting dates: March–April or Aug
Soil pH: 6.0–7.0
Soil adaption: Wide
Planting depth: 1”
Approximate seeds/lb: 8,000–9,000
Seeding rate: 120 lbs/A
70 lbs/A nurse crop

Days to germination: 7–10
Main usage: Baleage, silage, nurse crop
Height at maturity: 2’–5’
Length of stand: 1 cut
Reproduces by: Seed

50% Haywire Forage Oats 50% Stockade Forage Peas

- 60 days from emergence to harvest; best when oats are in the boot stage
- High quality haylage
- Great nurse crop for a forage seeding
- Fits well before or after a summer annual crop
- Tolerates frost or light freeze
- Spectacular yield & quality with Haywire Oats

Udder Filler Forage Mix

Plant type: Annual Mix
Planting dates: March–April or Aug
Soil pH: 6.0–7.0
Soil adaption: Wide
Planting depth: 1/2”–1”
Approximate seeds/lb: 82,000
Seeding rate: 120 lbs/A
50 lbs/A nurse crop

Days to germination: 7–10
Main usage: Baleage, silage, nurse crop
Height at maturity: 2’–5’
Length of stand: 1 cut
Reproduces by: Seed

70% Elevator Triticale 30% Winterhawk Annual Ryegrass

- Fast forage. Ready in 60-80 days
- Responds well to nitrogen/manure applications
- For haylage/silage/green-chop
- High carbohydrates
- High protein

HayMaster Grass Mix

Plant type: Perennial Grass Mix
Planting dates: April–May or Aug–Sept
Soil pH: 6.0–7.0
Soil adaption: Wide
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 183,000
Seeding rate: 25–30 lbs/A
5–15 lbs/A mix

Days to germination: 7–14
Main usage: Pasture, baling, nurse crop
Height at maturity: 3’–4’
Length of stand: 4–8 years
Reproduces by: Seed

50% MacBeth Meadow Brome 50% Preval Meadow Fescue

- Excellent companion for alfalfa
- Excellent for all-grass hay
- Excellent season-long production (multi-cut mixture)
- Outstanding winterhardiness
- Responds well to nitrogen/manure applications
- Produces under tough hot, dry conditions

Premium Pasture Mix

Plant type: Perennial Mix
Planting dates: April–May, Aug
Soil pH: 6.3–7.0
Soil adaption: well–mod-well drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 374,000
Seeding rate: 30–35 lbs/A

Days to germination: 7–10
Main usage: Pasture, hay, baleage
Height at maturity: 2’–4’
Length of stand: 3–7 years
Reproduces by: Seed

50% Enduro Elite Alfalfa
10% Kootenai Timothy
5% Super Haifa White Clover
30% Gallant Medium Red Clover
5% Profit Orchardgrass

- All top producing, forage researched, value added varieties - no cheap fillers
- Balanced alfalfa/clover/grass mix for flexible use as hay or pasture
- Can be used for a legume base to add selected forage grasses for permanent pasture
- Only elite varieties

Baler Mix

Plant type: Perennial Mix
Planting dates: April–May, Aug
Soil pH: 6.2–7.0
Soil adaption: well–mod-well drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 343,000
Seeding rate: 30–35 lbs/A

Days to germination: 7–10
Main usage: Hay, baleage, pasture
Height at maturity: 2’–4’
Length of stand: 3–7 years
Reproduces by: Seed

65% Enduro Elite Alfalfa
10% Kootenai Timothy
20% Gallant Red Clover
5% Profit Orchardgrass

- All top producing, forage researched, value added varieties - no cheap fillers
- Can be baled, chopped, or used for pasture
- Very flexible mix that is inoculated and ready to be planted
- Only elite varieties

Beef Pasture Mix

Plant type: Perennial Mix
Planting dates: April–May, Aug
Soil pH: 6.0–7.0
Soil adaption: Well–mod-well drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 421,000
Seeding rate: 30–35 lbs/A

Days to germination: 7–10
Main usage: Pasture, hay, baleage
Height at maturity: 2’–4’
Length of stand: 3–7 years
Reproduces by: Seed

50% Bronson Tall Fescue
8.5% Gallant Red Clover
40% STF-43 Tall Fescue
1.5% Jumbo II Ladino Clover

- Formulated for top animal production for beef producers
- Works well for hay or grazing
- Can be stockpiled
- Soft, highly palatable fescues

Hay & Graze Clover Mix

Plant type: Perennial Mix
Planting dates: April–May, Aug
Soil pH: 6.0–7.0
Soil adaption: Well–mod-well drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 350,000
Seeding rate: 2–8 lbs/A

Days to germination: 7–10
Main usage: Pasture, baleage
Height at maturity: 1’–3’
Length of stand: 3–7 years
Reproduces by: Seed

70% Gallant Red Clover
30% Kopu II White Clover

- Mix of outstanding clovers formulated at just the right percentage to give the best benefit for production livestock managers
- Overseed grass pastures
- Great for frost seeding
- Proper formula of red to white clover

Drought Buster Mix

Plant type: Perennial Mix
Planting dates: April–May, Aug
Soil pH: 6.0–7.0
Soil adaption: Well–mod-well drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 400,000
Seeding rate: 20–25 lbs/A

Days to germination: 7–10
Main usage: Pasture, baleage
Height at maturity: 2’–4’
Length of stand: 3–7 years
Reproduces by: Seed

30% Tekapo Orchardgrass
25% Gallant Red Clover
10% Kopu II White Clover
25% Endure Chicory
10% Feast II Short Rotation Ryegrass

- Specially formulated for cattle and goats for high animal production
- Displays excellent drought tolerance and very high tonnage of outstanding forage
- Can take tough growing conditions

Tri Feast Forage Mix

Plant type: Annual Mix
Planting dates: April–May, Aug
Soil pH: 6.0–7.0
Soil adaption: Well–mod-well drained
Planting depth: 1/2”–1”
Approximate seeds/lb: 82,000
Seeding rate: 100–120 lbs/A

Days to germination: 7–10
Main usage: Pasture, baleage, silage
Height at maturity: 2’–4’
Length of stand: 1–3 cuts
Reproduces by: Seed

70% Winter Triticale
30% Feast II Tetraploid Short Rotation Ryegrass

- Designed to increase forage tonnage and high quality forage fast
- Will overwinter for a spring harvest
- Early maturity in spring
- Harvest at pre boot

Horse Hay Mix

Plant type: Perennial Mix
Planting dates: April-May, Aug
Soil pH: 6.0–7.0
Soil adaption: Well–mod-well drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 343,000
Seeding rate: 20–25 lbs/A

Days to germination: 7–10
Main usage: Hay, pasture, baleage
Height at maturity: 2’–4’
Length of stand: 3–7 years
Reproduces by: Seed

58% Enduro 427 LHR
15% Albion Perennial Ryegrass
19% Tekapo Orchardgrass
8% Tuuka Timothy

- Equal mixture of alfalfa and grass for great horse hay
- Includes Potato Leafhopper Resistant alfalfa
- Works best in well drained soil
- Proper forage for equine

Pasture Perfect®

The Brand of Choice

Since 1997, the Pasture Perfect® brand has provided the finest forage seed varieties available on the market for grazing tolerance, leaf disease and drought tolerance, yield, and quality. The Pasture Perfect® brand never stops improving. We are always updating our mixes with the best possible ingredients. We believe our mixes put the "Perfect" in Pasture Perfect®.

Champion Pasture Mix

20% Devour Orchardgrass
20% Profit Orchardgrass
15% Perseus Festulolium
15% Power Tetraploid Per. Ryegrass
10% MacBeth Meadow Bromegrass
10% Albion Tetraploid Per. Ryegrass
5% Ginger Kentucky Bluegrass
5% Kootenai Timothy

Formulated with grass varieties selected for horses and all production animals. It is a mix of highly palatable varieties that make super quality forage. Top choice for grazing and hay. Seed at 35-50 lb/A

Midwestern Grazer Mix

35% Devour Orchardgrass
15% Profit Orchardgrass
15% Preval Meadow Fescue
10% MacBeth Meadow Bromegrass
15% Power Tetraploid Per Ryegrass
7% Gallant Red Clover
3% Kopu II White Clover

Midwestern Grazer is intended for use with managed intensive grazing practices. This is a mix of highly palatable grasses and legumes that make high quality forage for making milk or meat. Also a great hay mix. Seed at 30-40 lb/A

Superior Forage Mix

30% Proprietary Alfalfa
18% Profit Orchardgrass
15% Bronson Tall Fescue
15% Gallant Red Clover
15% Preval Meadow Fescue
5% Kootenai Timothy
2% Kopu II White Clover

Superior Forage is a mix of highly palatable varieties that make high quality forage for making milk or putting weight on growing livestock. Can be used for hay silage, dry hay, and managed intensive grazing. Seed at 35-50 lb/A

Renovator Special Mix

20% Albion Tetraploid Per. Ryegrass
30% Power Tetraploid Per Ryegrass
20% Perseus Festulolium
30% Feast II Tetraploid Short Rotation Ryegrass

Renovator Special is specially designed for renovating existing pastures. Renovator Special works well for inter-seeding into existing horse and cattle pastures. It is also used for improving weak alfalfa stands. Dairy, beef, and sheep producers, along with horse owners can all benefit from using Renovator Special. It is low endophyte. Seed at 10-25 lb/A

Summer Annuals

Summer annuals have become more than just an emergency forage crop to many producers. Summer annuals can be planted as a primary crop or a double crop. They exhibit rapid growth in hot, humid conditions and can yield two to six tons per acre. Planting can occur once the soil temperature reaches 62° F. Summer annuals require nitrogen (N) fertilization, usually 1 lb/A of N per day of growth. These crops are also more water efficient and can be productive when cool season crops are slowing down due to heat and dry weather. Strongly consider making them part of your forage crop rotation.

Prussic Acid is a concern with grain sorghum, forage sorghum, sorghum sudangrass, and sudangrass. The only summer annual not affected is pearl millet. Prussic acid occurs any time the plants encounter stress, especially a frost or freeze. Extreme drought can also cause high levels of prussic acid in summer annual plants. If the plants are subject to a hard frost or freeze, do not harvest or graze for 7-10 days. This allows the prussic acid (HCN gases) to dissipate from the plant. Do not start grazing if the plants are showing visible signs of drought stress. High N levels and low phosphorous (P) levels can increase prussic acid levels in plants. If you are unsure about prussic acid levels, err on the side of caution and send a sample into the lab.

Nitrate Poisoning in summer annuals can occur under certain conditions. High nitrogen (N), drought stress, or prolonged overcast conditions can cause high to toxic levels of nitrate to accumulate in the plant, especially in the lower stalk and stem. This in turn can be passed onto livestock. The excess nitrate causes loss of oxygen carrying capacity in the blood of the livestock. Symptoms include rapid, shallow breathing, muscle tremors, staggering, and ultimately death. Plants can be tested by a reputable lab for nitrate levels. A veterinarian should be immediately contacted if you believe livestock have been exposed to forage high in nitrates.

Sorghum-Sudan

Plant type: Annual Grass
Planting dates: May–July
Soil pH: 6.0–7.0
Soil adaption: Wide, 60° or warmer soil temperature
Planting depth: 3/4"–1 1/4"
Approximate seeds/lb: 15,000–19,000
Seeding rate: 20–50 lbs/A

Days to germination: 7
Main usage: Green chop, hay, silage
Height at maturity: 5'–7'
Length of stand: Annual
Reproduces by: Sterile
Pounds per bushel: 56
Precautions: Prussic Acid, Nitrate Poisoning

Sweet Six BMR Dry Stalk

- Rapid growth, 45-55 days to first harvest
- 30-35 days between subsequent harvests
- BMR 6 gene, reduced lignin content up to 33% as compared to a conventional sorghum sudangrass
- Fine stemmed, high palatability with rapid regrowth
- Dry stalk gene provides reduced plant moisture content
- Best sorghum sudangrass for dry baling
- Seed at 35-50 lb/A, higher rates reduce stem diameter
- Graze at 24-30", harvest at 30-50"
- Organic seed available

Adaption Ratings	
Photosynthetic type	Warm Season
Photoperiod	Insensitive
Soil temperature	Warm (62°F)
Water requirement	Low

Disease/Insect/Nematode Ratings	
Anthracnose	R
Downy mildew	MR

Crop Use Information	
Life cycle	Annual
Ease of establishment	Good
Drought stress	Good
Minimum pH	6.0
Hay	Excellent
Silage	Excellent
Rotational grazing	Excellent
Palatability	Excellent

Agronomic Traits	
Early seedling vigor	Good
Growth habit	Upright
Recovery after cutting	Very good
Maturity	55–65 days to boot
Harvest	45–55" or when crop is at 50% boot stage
Uniformity	Good
Midrib type	Brown

Sweet-Forever BMR

- 55-60 days to first harvest
- 30-60 days between subsequent harvests
- Broad harvest window
- BMR 6 gene reduces lignin content
- Photoperiod sensitive, will not head out until day length is < 12 h 17 m
- Maintains forage quality throughout the growing season
- Fits as a tool to manage weather risks with delayed harvests
- Seed at 35-50 lb/A, higher rates reduce stem diameter
- Graze at 24-30", harvest at 30-50"

Adaption Ratings	
Photosynthetic type	Warm season
Photoperiod	Sensitive
Soil temperature	Warm (62°F)
Water requirement	Very Low

Disease/Insect/Nematode Ratings	
Anthracnose	R
Downy mildew	R

Crop Use Information	
Life cycle	Annual
Ease of establishment	Good
Drought stress	Excellent
Minimum pH	6.0
Hay	Excellent
Silage	Excellent
Rotational grazing	Excellent
Palatability	Outstanding

Agronomic Traits	
Early seedling vigor	Excellent
Growth habit	Upright
Recovery after cutting	Excellent
Maturity	12 h 20 m or less of day length
Harvest	40–84"
Uniformity	Excellent
Midrib type	BMR/Juicy-Sweet

Super Sugar DM

- 55-60 days to first harvest
- 30-40 days between subsequent harvests
- Conventional SSG with crude protein levels reaching 16-18%
- Fine stemmed
- Delayed Maturity (DM) trait keeps plants from heading out for up to 90 days
- Fits as a tool to manage weather delayed harvests
- Seed at 35-50 lb/A, higher rates reduce stem diameter
- Graze at 24-30", harvest at 30-50"

Adaption Ratings	
Photosynthetic type	Warm season
Photoperiod	Insensitive
Soil temperature	Warm (62°F)
Water requirement	Low

Disease/Insect/Nematode Ratings	
Anthracnose	R
Downy mildew	R

Crop Use Information	
Life cycle	Annual
Ease of establishment	Good
Drought stress	Excellent
Minimum pH	6.0
Hay	Excellent
Silage	Excellent
Rotational grazing	Excellent
Palatability	Excellent

Agronomic Traits	
Early seedling vigor	Excellent
Growth habit	Upright
Recovery after cutting	Excellent
Maturity	90–95 days to boot
Harvest	24-50"
Uniformity	Excellent
Midrib type	Non-BMR

Sudangrass

Plant type: Annual Grass
Planting dates: May–July
Soil pH: 6.0–7.0
Soil adaption: Wide, 60° or warmer soil temperature
Planting depth: 1/2”
Approximate seeds/lb: 170,000
Seeding rate: 35–50 lbs/A
Days to germination: 5–7
Main usage: Grazing, hay, silage
Height at maturity: 4’–6’
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 40
Precautions: Prussic Acid, Nitrate Poisoning

Pro-Max BMR

- BMR 12 gene, reduced lignin content
- Rapid growth, first harvest in 45-50 days
- Sudan x Sudan creates a fine stemmed crop
- Smaller stem diameter, good choice for dry baling
- Seed at 35-50 lb/A, higher rates reduce stem diameter
- Graze at 24-30”, harvest at 30-50”

Forage Sorghum

Plant type: Annual Grass	Days to germination: 7
Planting dates: May–July	Main usage: Hay, silage
Soil pH: 6.0–7.0	Height at maturity: 5'–8'
Soil adaption: Wide, 60° or warmer	Length of stand: Annual
Planting depth: 1"–1 1/2"	Reproduces by: Sterile
Approximate seeds/lb: 13,000–15,000	Pounds per bushel: 56
Seeding rate: 60-80,000 population 20" to 30" rows	Precautions: Prussic Acid, Nitrate Poisoning

Forage sorghum has made vast improvements in forage quality and yield over the last decade. *CISCO* has selected varieties fit to the Midwest either as a primary forage crop or as a double crop option. Forage sorghums can be managed one of two ways. The first is as a conventional direct chop silage crop. The other option is to mow the forage sorghum in the early boot stage, wilt it, and chop or wet wrap it. When the plants regrow they can be mowed in the early boot stage again. This offers producers a higher yielding, higher quality option with less harvests than a sorghum sudangrass hybrid. Also, this allows forage sorghum to be grown in a shorter than normal growing season if extra forage is needed. Follow seeding rates closely, as over planting the recommended seeding rates can cause lodging.

Silo-Pro Brachytic Dwarf BMR

- BMR 6, 95 days to soft dough stage hybrid
- Brachytic dwarf gene keeps maximum height at 6-7' tall
- Very large leaves that canopy quickly
- Significantly lower inputs compared to corn silage
- Can yield 15 to 25 T/A
- Seed at 45,000 – 75,000 seeds/ac in 20" to 30" rows

GW 400 BMR

- BMR 6
- Medium-early maturity, sterile hybrid
- High sugar content, juicy stalk
- Seed at 64,000 – 95,000 seeds/ac in 20” to 30” rows
- Organic seed available

Adaption Ratings	
Photosynthetic type	C4-Warm Season
Soil temperature	Warm (62°F)
Water requirement	Low

Disease/Insect/Nematode Ratings	
Downy mildew	R

Crop Use Information	
Life cycle	Annual
Ease of establishment	Good
Drought stress	Good
Minimum pH	6.0
Hay	Excellent
Silage	Excellent
Rotational grazing	OK to graze re-growth
Palatability	Excellent

Agronomic Traits	
Early seedling vigor	Good
Growth habit	Upright with sterile head
Recovery after cutting	Good with water
Maturity	103 days to soft dough
Uniformity	Excellent
Plant color	Tan
Standability	Good
Midrib type	Brown

Planting Rates		
Bushel weight	56lbs	
Seeds per lb	16,000	
Rate (lbs)	Dryland	Irrigated
Rows	4–8	8–12
Broadcast	4–10	15–30
Seeds/sq.ft.	2–4	6–12

475 BMR Dry Stalk

- BMR 6
- 75 days to soft dough stage
- Great double crop forage sorghum for the Midwest
- Grows 6-7’ tall
- Dry stalk trait for more rapid dry down

2120

- Rox Orange Cane parentage
- Medium maturity male sterile forage sorghum
- High sugar content at maturity
- Great for wildlife

Grain Sorghum

Plant type: Annual Grass
Planting dates: May–August
Soil pH: 6.0–6.5
Soil adaption: Wide, 60° or warmer soil temperature
Planting depth: 1"–1 1/2"
Approximate seeds/lb: 14,000
Seeding rate: 4–20 lbs/A

Days to germination: 7
Main usage: Wildlife, grain
Height at maturity: 3'–4'
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 56
Precautions: Prussic Acid, Nitrate Poisoning

Worldwide, sorghum is a food grain for humans. In the United States, sorghum is used primarily as a feed grain for livestock. Grain sorghum types are relatively short growing (less than six feet) and provide moderate yields when harvested as forage. Grain sorghum varieties are classed in seven agronomic groups, however, milo is the only economic one for the Midwest. Leaf blades are wavy with a yellow midrib. Heads are bearded or awned, compact, and oval in shape. Seeds are large, pale pink to cream in color. Plants tend to be more tolerant to heat and drought. Feed value of grain sorghum is similar to corn. Grain sorghum can also make a great, simple spring/summer food plot for deer. It is a great choice for plots where high Whitetail deer volumes prevent other grain crops from making it through the summer.

Wilder

- Primarily used as wildlife food in the Midwest
- Heat and drought tolerant
- Grain can be used for livestock feed
- Grows 3-4' tall and produces grain in 90 days or less
- Becomes more palatable throughout the fall

Martin

- Medium open pollinated grain sorghum
- Semi-compact head
- Excellent drought tolerance
- Use for dry land milo production or wildlife plots
- High grain yielder

Pearl Millet

Plant type: Annual Grass
Planting dates: May–July
Soil pH: 5.5–7.5
Soil adaption: Wide, 60° or warmer soil temperature
Planting depth: 1/2”
Approximate seeds/lb: 60,000
Seeding rate: 16–20 lbs/A
Days to germination: 10
Main usage: Hay, graze
Height at maturity: 2’–4’
Reproduces by: Seed
Pounds per bushel: 52

Sweet Summer BMR

- 50-60 days to first harvest
- Rapid regrowth, 30-40 days between subsequent harvests
- BMR gene technology for improved feed intake and digestibility
- Dwarfing gene for increase leaf to stem ratio and better standability
- No prussic acid concerns, safe for horses
- Safe to graze after a freeze, consider stockpiling

Tifleaf III

- High quality leafy three-way hybrid pearl millet
- Good resistance to leaf rust
- High yielding; producing good gains on livestock
- Drought tolerant
- Can persist and yield well on less than ideal soils
- Harvest at 24-36” in height

German Foxtail Millet

Plant type: Annual Grass
Planting dates: May–July
Soil pH: 6.0–7.0
Soil adaption: Wide, 60° or warmer soil temperature
Planting depth: 1/2”
Approximate seeds/lb: 220,000
Seeding rate: 20–30 lbs/A

Days to germination: 10
Main usage: Hay, graze
Height at maturity: 2’–4’
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 50

German Foxtail Millet

- Fast maturing summer annual grass
- One cut harvest available 60 days after emergence
- Great for double cropping
- Very low water use
- Great for wildlife
- Allow six weeks after German Foxtail millet before planting wheat to avoid potential carryover of a mosaic virus from the GF millet to wheat

Japanese Millet

Plant type: Annual Grass
Planting dates: May–June
Soil pH: 5.5–6.5
Soil adaption: Well suited for areas with wet conditions
Planting depth: 1/2”
Approximate seeds/lb: 155,000
Seeding rate: 15–30 lbs/A
9–12 lbs/A mix

Days to germination: 10
Main usage: Wildlife food plots
Height at maturity: 1’–5’
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 35

Japanese Millet

- Most rapid growth millet; 45 days to seed production
- Likes wetter, muddy areas
- Great for waterfowl and other wildlife
- Not recommended for hay or silage because of its coarse, unpalatable characteristics

Teff Grass

Plant type: Annual Grass
Planting dates: May–July
Soil pH: 6.0–7.0
Soil adaption: Wide, 60° or warmer soil temperature
Planting depth: 1/8"–1/4"
Approximate seeds/lb: 1,250,000
Seeding rate: 10–12 lbs/A
Days to germination: 3–5
Main usage: Hay, silage, grazing after 1 cut
Height at maturity: 1'–2'
Length of stand: Annual
Reproduces by: Seed

CISCO Summer Delite

- Fine stemmed, leafy summer annual grass that exhibits rapid growth
- Potential to produce 1.5 to 2.5 T/A in 45-55 days
- Harvest regrowth every 30-45 days
- Best suited for dry hay production, especially the horse market
- Requires a very firm seedbed, 65°F plus soil temperatures, and a seeding depth of 1/8"
- Requires nitrogen (N) fertilization and hot growing conditions
- Summer Delite coated at 34%

Buckwheat

Plant type: Annual Grain	Days to germination: 7–10
Planting dates: June–August	Main Usage: Wildlife, cover crop, grain
Soil pH: 5.0–6.5	Height at maturity: 2'–3'
Soil adaption: Wide range of soils	Length of stand: Annual
Planting depth: 1"–1 1/2"	Reproduces by: Seed
Approximate seeds/lb: 14,200	Pounds per bushel: 60
Seeding rate: 35–50 lbs/A	

Buckwheat

- Rapid growing broadleaf small grain
- Will flower in 35 to 45 days
- Small tap root system
- Great for mineralizing phosphorous (P) and sulfur (S) from the soil
- Great as a cover crop or a wildlife plot

Forage Soybeans

Plant type: Annual legume
Planting dates: May–June
Soil pH: 6.0–7.0
Soil adaption: Well drained, moderate to good fertility
Planting depth: 3/4”–1 1/2”
Approximate seeds/lb: 2,600
Seeding rate: 140,000–160,000/A

Days to germination: 5–7
Main Usage: Grazing, silage
Height at maturity: 3’–6’
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 60

Forage Soybeans

- Group 5.6 forage soybean
- Ranges 17-25% in crude protein
- Can be mixed with other summer annual crops such as sorghum sudangrass
- Developed at University of Arkansas as a forage soybean
- Can grow 4-6’ tall, deliver high yields
- Resistant to SDS, soybean mosaic virus, and frogeye leafspot
- Non GMO

Cereal Grains

Cereal grains are an important part of modern agriculture, whether it is for grain, forage, or a cover crop. Cereal grains are also used as a nurse crop in newly seeded hay fields and pastures. They fit into a short rotation and can tolerate cooler temperatures than other crops.

Oats

Plant type: Annual Grain

Planting dates: March–April forage or grain production; Aug–Oct cover crop or forage

Soil pH: 5.5–7.0

Soil adaption: Wide range of soils

Planting depth: 1/2”

Approximate seeds/lb: 14,000

Seeding rate: 64–96 lbs/A

Days to germination: 10

Main Usage: Cereal grain, nurse crop, cover crop, forage crop

Height at maturity: 3’–5’

Length of stand: Annual

Reproduces by: Seed

Pounds per bushel: 32

- Spring or fall seed
- Grain 64 lb/ac (2 bu/ac)
- Forage 100 lb/ac (3 bu/ac), approximately 55-60 days to late boot stage
- Nurse crop 32 lb/ac (1 bu/ac)
- Cover crop 15-50 lb/ac
- Freeze at 20-22°F

Haywire

- High yielding, high quality forage oat
- About 58 days to boot stage
- Excellent standability
- Lead 2014 Pennsylvania trial in forage quality

Reins

- Moderately early grain oat
- High yield potential with great test weight
- Uniform plant characteristics and disease resistance
- Great lodging resistance
- Moderately short plant height
- Good tolerance to barley yellow dwarf and loose smut

Jerry

- Dual purpose grain/forage oat
- Great as a cover crop
- Good lodging resistance
- Good yields and straw production

Cosaque Black Winter

- Great yield, can match cereal rye yields
- Great for braking up disease cycles, especially certain nematodes
- Works well for forage, cover crop, or biomass
- Cold tolerant

Barley

Plant type: Annual Grain	Days to germination: 7
Planting dates: March–May or Sept–Oct	Main Usage: Grain, forage
Soil pH: 6.0–7.0	Height at maturity: 3'–5'
Soil adaption: Well drained	Length of stand: Annual
Planting depth: 1"–1 1/2"	Reproduces by: Seed
Approximate seeds/lb: 12,500	Pounds per bushel: 48
Seeding rate: 75–100 lbs/A	

Lacey (Spring)

- Six row malting barley
- Consistently top yielder
- Received favorable reviews for brewing characteristics
- Released by Minnesota Ag Experiment Station

Valor (Winter)

- Six-rowed, short awned barley
- Excellent winterhardiness
- High quality, high yielding forage
- Winter barley needs to be seeded early fall
- Early to mature in the spring, about two weeks before wheat

Nomini (Winter)

- Early maturity, medium height
- Six-rowed, compact spikes
- Not as winterhardy as other barleys

Cereal Rye

Plant type: Annual
Planting dates: Sept-Nov
Soil pH: 5.0–7.0
Soil adaption: Wide range of soils
Planting depth: 1”–1 1/2”
Approximate seeds/lb: 18,000
Seeding rate: 50–100 lbs/A

Days to germination: 7–10
Main Usage: Grazing, green manure, silage, cover crop
Height at maturity: 5’–7’
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 56

Graze King 90

- High quality, forage type cereal rye
- Larger leaves, more tillers per plant than common cereal rye
- Higher yielding than common cereal rye
- Harvest in late boot stage for optimal quality

Common Cereal Rye

- High yielding fall seeded forage
- Very winter hardy
- Early to mature in the spring
- Harvest in the boot stage for optimal quality
- Graze in vegetative stage for high quality pasture
- Forage quality declines rapidly with maturity
- Huge root mass for improved soil conservation
- Professionally grown, conditioned, and tested - No noxious weeds that can occur with locally produced rue

Triticale

Plant type: Annual Grain
Planting dates: March–April or Sept–Oct
Soil pH: 6.0–7.0
Soil adaption: Wide range of soils
Planting depth: 1/4”–1/2”
Approximate seeds/lb: 20,000
Seeding rate: 100–126 lbs/A
50–70 lbs/A mix

Days to germination: 10
Main Usage: Grazing, hay, silage
Height at maturity: 3’–4’ (spring)
5’–7’ (fall)
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 42

Elevator (Spring)

- High yielding spring seeded forage
- Excellent nurse crop
- Harvest in the boot stage for optimal quality
- Graze in vegetative stage for high quality pasture
- Forage quality declines rapidly with maturity
- Huge root mass for improved soil conservation

Fall Triticale

- Hybrid between wheat and cereal rye
- Slightly improved forage quality as compared to cereal rye
- Matures about two weeks later than cereal rye, but two weeks before wheat
- Tillers well with a high leaf/stem ratio

Forerunner (Fall)

- Awnless triticale
- Great for silage or pasture
- Can reach 50-60" in height
- Large, soft leaves with a great leaf/stem ratio

Traction (Fall)

- Excellent winterhardiness
- Superior straw strength
- High forage yield
- Bearded; great for green chop
- Disease leaf resistance

TriCal Flex 719 (Fall)

NEW FOR 2018!

- Great for grazing, silage, or dry hay
- Outstanding yield and quality
- Awnletted (reduced beard length)
- Medium plant height
- Well adapted to northern United States

Spelt

Plant type: Annual Grain
Planting dates: Sept–Oct
Soil pH: 6.0–7.0
Soil adaption: Wide range of soils
Planting depth: 1”–1 1/2”
Approximate seeds/lb: 14,000 dehulled
Seeding rate: 80–100 lbs/A
Days to germination: 7
Main Usage: Grain
Height at maturity: 3’–4’
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 40

Sungold

- Sub-species of common wheat
- Used as an alternative grain for oats or barley
- Can be utilized for hay or grazing
- Seed at 80-100 lbs/ac
- Can be utilized like oats, wheat, or barley either as grain or a forage
- Excellent standability & winter survival
- Medium brown chaff
- Food grade spelt
- Well adapted to Midwest growing conditions

Cover Crop Wheat

Plant type: Annual Grain
Planting dates: Aug–Oct
Soil pH: 6.0–7.0
Soil adaption: Wide range of soils
Planting depth: 1”–1 1/2”
Approximate seeds/lb: 12,000
Seeding rate: 50–100 lbs/A

Days to germination: 7–10
Main Usage: Cover crop
Height at maturity: 3’–4’
Length of stand: Annual
Reproduces by: Seed
Pounds per bushel: 60

Cover Crop Wheat

- Great for cover crop, erosion control, or green manure crop
- Great root system for building organic matter
- Great nurse crop for red clover or sweet clover
- Easily terminated in the spring
- Non GMO

Chicory

Plant type: Perennial Herb
Planting dates: April–May, August
Soil pH: 5.5–7.0
Soil adaption: Dry, well-drained
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 425,000
Seeding rate: 6–8 lbs/A
1–4 lbs/A mix

Days to germination: 7–21
Main Usage: Grazing, wildlife
Height at maturity: 1’–3’
Length of stand: 1–7 years
Reproduces by: Seed

Grazing recommendations

- Do not graze until chicory is at least 8” tall (generally occurs 60–80 days after seeding)
- Graze no lower than 3”
- Chicory should be allowed to accumulate growth of 4–6” before going dormant in the fall
- A rest period of 14–25 days between grazing periods is best for chicory persistence and performance
- Caution should be taken to not overgraze in August as chicory growth slows during periods of high temperatures

Oasis

- High quality summer forage
- Broadleaf perennial herb
- Suitable for all types of livestock
- Tolerates hot, dry conditions
- High magnesium (Mg) content that can help control grass tetany in grazing cattle

Endure

- Lower bolting
- Summer long production
- Fast establishing
- Strong regrowth
- High forage yield
- Improved persistence in wet soil
- Excellent forage quality

Kale

Plant type: Annual Brassica
Planting dates: July-Aug
Soil pH: 5.5–7.0
Soil adaption: Wide
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 130,000
Seeding rate: 3–4 lbs/A
1 lbs/A mix

Days to germination: 5–7
Main Usage: Wildlife, forage
Height at maturity: 2’–4’
Length of stand: Annual
Reproduces by: Seed

Kale is a summer seeded brassica that is used for fall grazing. It has low fiber stems and is easily digested by livestock. It needs to be seeded when soil temperatures are above 50°F. Kale works well as an intermediate crop when renovating pastures.

Maris Kestrel

- Full maturity variety with short stems
- Low fiber stems with high digestibility
- 150-220 days to grazing
- Extends grazing season as cool season pasture ends

Rape

Plant type: Annual Brassica	Soil adaption: Wide
Planting dates: August	Days to germination: 5–7
Soil pH: 5.5–7.0	Main Usage: Wildlife, forage, cover crop
Planting depth: 1/8”–1/4”	Height at maturity: 3’–4’
Approximate seeds/lb: 120,000	Length of stand: Annual
Seeding rate: 6–8 lbs/A 1–2 lbs/A mix	Reproduces by: Seed

Bonar

- Late maturing forage rape with short stems and large leaves
- Great for finishing livestock in the fall
- Good source of winter feed after row crops
- Caution: can change milk flavor in dairy cattle

Dwarf Essex

- Cool season brassica that works well alone or seeded with oats
- Can start grazing 8-10 weeks after seeding
- Large leaves, high quality forage
- Frost increases sugar concentration in leaves
- Not suited for hay or silage due to high plant moisture content
- Great cover crop

Radish

Plant type: Annual Brassica
Planting dates: Early Aug-Sept
Soil pH: 6.0–7.0
Planting depth: 1/4”–1/3”
Approximate seeds/lb: 35,000
Seeding rate: 6–8 lbs/A
1–4 lbs/A mix

Soil adaption: Wide range of soils
Days to germination: 4–6
Main Usage: Cover crop, wildlife, soil builder
Height at maturity: 2’–3’
Length of stand: Annual
Reproduces by: Seed

Scav-N-Ger®

- Daikon type radish
- Great nutrient scavenger
- Mixes well with small grains and grasses
- Earthworm “magnets”
- Deep taproots and fine root hairs
- Repositions nutrients from soil profile

GroundHog

- Daikon cover crop radish that produces significant root mass
- Nitrogen mining, nutrient scavenging, and nutrient repositioning
- Great food source for earthworms
- Improves soil biology
- Can suppress undesired weeds

The Buster

- Late flowering Daikon radish
- Great nutrient scavenger
- Reduces soil compaction
- Improves soil health and biology
- Good for wildlife plots

Respect

- Biofumigant for control of beet cyst nematode
- Well suited for erosion control and soil tilth
- Aids in reduction in soil compaction
- Can be used for grazing and forage

Turnips

Plant type: Annual Brassica
Planting dates: March–April, August
Soil pH: 5.5–7.0
Planting depth: 1/8”–1/4”
Approximate seeds/lb: 240,000
Seeding rate: 3–10 lbs/A
1–2 lbs/A mix

Soil adaption: Wide
Days to germination: 5–7
Main Usage: Grazing, forage
Height at maturity: 2’–3’
Length of stand: Annual
Reproduces by: Seed

Appin

- Vigorous establishment and quick maturity, 60-100 days
- High leaf production
- Multiple grazings, leaves and tubers
- Mixes very well with oats
- Plant late summer/early fall

Pasja

- Hybrid forage brassica with early maturity (50-70 days)
- Turnip/Chinese cabbage hybrid developed in New Zealand
- High leaf/bulb ratio
- Tolerates heat better than other forage turnips
- Can yield up to 4 t/A dry matter

Purple Top

- High quality, high bulb yielding turnip
- Grow with the “globe” exposed providing easy access to the entire plant
- Can utilize in summer or fall
- Used for livestock or wildlife
- Mixes with cereal grains well, especially oats

BARENBRUG

Remington plus NEA2 Perennial Ryegrass
High yielding, high quality tetraploid perennial ryegrass with the beneficial endophyte NEA2.

Milkway® Meadow Fescue
High yielding meadow fescue with extremely digestible soft leaved tall fescue. NutriFiber program

STF-43™ Tall Fescue
A blend of late maturing, soft leaved tall fescues-highly digestible. NutriFiber program

Barolex Tall Fescue
A fine-leafed tall fescues that combines late maturity, feed quality and palatability.

Baroptima Plus E34 Tall Fescue
A high energy and high yielding tall fescue, which is bred in association with the revolutionary beneficial endophyte E34.

Green Spirit® Italian Ryegrass
Perfect blend of diploid and tetraploid Italian ryegrass. High quality emergency feed. NutriFiber program

Barfest Festulolium
Late maturing, winter hardy, highly palatable & produces less seed heads. Excellent rust resistance.

HLR Orchardgrass
Contains the best and latest varieties from Barenbrug's breeding program. Selected for high leaf to stem ratio.

Barkant Turnip
Vigorous grower with high bulb yield and excellent top growth. High sugar content for great winter hardiness.

Freedom! Medium Red Clover
A high yielding clover that is fast drying, palatable, and nutritious. High forage quality.

Alice White Clover
Large leaves, persistent, and winter hardy. Does not vertake grass.

Barpenta Timothy
A very late heading variety that is a very high dry matter yield producer. Diversify your cutting schedule with this late maturing variety.

Hakari Alaskan Bromegrass
Very fast to establish & regrow. Feed quality is high and it is late maturing. Very high-yielding.

Warm-Season Grasses

At Cisco, we pride ourselves in being able to supply all of your seed needs. Warm-season or "Native Prairie Grasses" are no exception. Warm-season grasses have many uses including wildlife, forage, conservation, and beautification. Generally these grasses are slow to establish, but are very persistent once they have established. May and June are ideal months to seed warm-season grasses. The can be drilled with the proper drill, frost seeded, or broadcast with a carrier. It is important to have good seed/soil contact. *CISCO* is also able to blend these grasses to fulfill any desired mixture. We offer the following warm-season grasses:

- Big Bluestem (7-10 lbs. per acre PLS)
- Blue Gramma Grass (2-3 lbs. per acre PLS)
- Buffalograss - 6-8 lbs. per acre alone
- Canada Wild Rye - 10-12 lbs. per acre alone
- Illinois Bundleflower - 2-3 lbs. per acre
- Indiangrass - 6 lbs. per acre
- Little Bluestem - 6 lbs. per acre PLS
- Partridge Peas - 10-15 lbs. per acre
- Riverbank Wild Rye - 15-20 lbs. per acre
- Sideoats Gramma - 3-4 lbs. per acre alone
- Switchgrass, Cave-in Rock (Tall Variety) - 5-8 lbs. per acre PLS
- Switchgrass, Dacotah - 5-8 lbs. per acre PLS
- Virginia Wild Rye - 8-10 lbs. per acre alone

Organic Seed

LEGUMES

WL 358 LH
Alsike Clover
Hairy Vetch
Austrian Winter Peas
Renegade Red Clover
Rivendel White Clover
Yellow Blossom Sweetclover
Medium Red Clover, VNS
Mammoth Red Clover
Medium Red Clover coated, VNS

FORAGE GRASSES

Niva Orchardgrass
Perun Festulolium
Dolina Timothy
Kora Forage Tall Fescue
Multimo Italian Ryegrass
Annual Ryegrass, VNS
Laura Meadow Fescue
Storm Intermediate Ryegrass
Calibra Tetreploid Perennial Ryegrass

MISCELLANEOUS SEEDS & SEED GRAINS

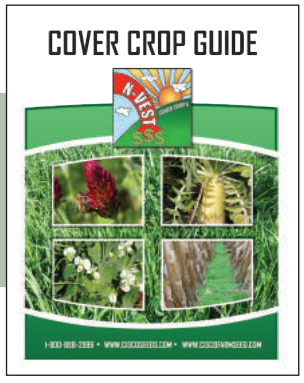
4010 Forage Peas
Jerry Oats
Buckwheat
Robust Spring Barley
Seahawk 6 BMR Sorghum Sudangrass
GW 400 Forage Sorghum

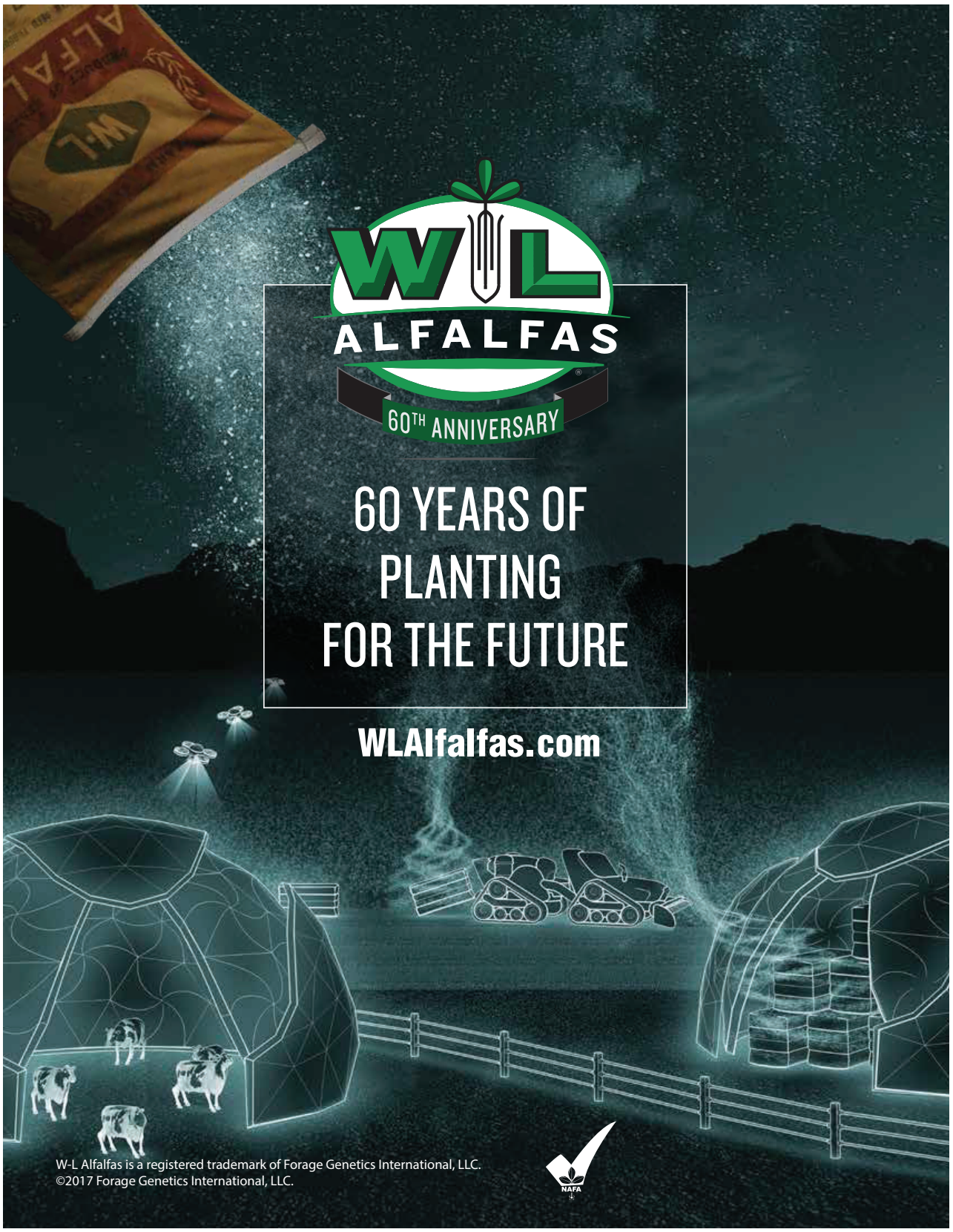
Did you know that *CISCO* has a demo plot? This demo plot is always open to all our dealers and their customers to come check out. We have 275 plots planted on our farm. We have cover crops, alfalfas, forages, turf grass, wildflowers, and more. You name it, we have it!

From the cross section of US 20 & State Road 15, you will head north on State Road 15 about 2 miles. Turn left (west) on County Road 14. You will stay on this road for about 1.5 miles, and then the *CISCO* Demo Plot will be on your left-hand side.

Our *CISCO* Farm Seed website is dedicated solely to the "small seed" part of the farming operation, namely hay, pasture, and cover crops. *CISCO*'s three full-time agronomists, as well as our dedicated sales force, post valuable information and news to our blog regularly. [www.ciscofarmseed.com]

CISCO also offers a guide focused solely on cover crops. Our Cover Crop Guide is packed full with informative articles regarding soil health and the benefits of cover crops. It also gives characteristics for specific crops and N-Vest® mixes. Ask for a copy, or find a digital version at www.ciscoseeds.com.

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NOTES

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