
LEAFY
CORN SILAGE
DESIGNED
FOR MAKING
MILK
dependable yields
quality fiber
digestible starch

Thank you for choosing to grow a Leafy or Floury Leafy Corn Silage Hybrid. As a corn breeder who grew up on a dairy farm, I know that feed is your largest expense and that the yield and quality of the forage you harvest each autumn plays a vital role in the health of your cows, the quantity and quality of the milk they produce, and your bottom line.

I began breeding corn plants with the Leafy gene in the 1980s soon after I founded Glenn Seed Ltd. This gene produced large plants with enormous ears and generated a lot of excitement in the breeding community. It took most of a decade to integrate this gene into the materials that I had in my program, to purify them and to create hybrids with excellent agronomics. While initially enthusiastic, other breeders moved away from this material because its kernels were too moist and too fragile for the grain market. Its stalks were too soft for late season harvest. It was in these same plant characteristics that I saw the opportunity for a unique silage-specific product type. In the decades since, we have dedicated our entire breeding program to the development of silage-specific corn hybrids for the complex agronomic and nutritional requirements of the dairy. Leafy Corn Silage Hybrids have been serving dairies across North America, Europe, Australasia and South America for over 25 years and Floury Leafy Corn Silage Hybrids have been making milk for almost ten years.

High quality silage is the foundation of success on a dairy. I hope that our silage products bring value and peace of mind as you focus on making high quality milk.

Thank you for your valued business,

Dr. Francis Glenn
President

Glenn Seed Ltd. is a family owned genetics company located in Ontario, Canada. It was founded in 1980 by Dr. Francis Glenn who has dedicated his career to the development of silage-specific corn hybrids for the dairy industry. In 2015, he was named Breeder of the Year by the Canadian Seed Trade Association.

LEAFY CORN SILAGE

GLENN SEED
FEED CORN BREEDERS

Contents

Expect more from your silage hybrid

STRONG AGRONOMICS

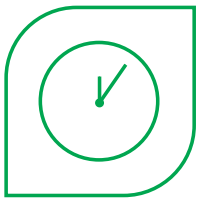
A reliable and robust crop is essential on a dairy. Silage hybrids need good stalks, strong roots and drought and disease resistance.

HIGH TOTAL PLANT YIELD

A corn silage hybrid should balance high yields of both digestible fiber AND starch.

LONG HARVEST WINDOW

To ensure the best quality silage makes it into the bunker, a hybrid should be slow-drying once it reaches optimal harvest moisture.

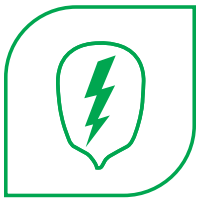


SHORT STORAGE PERIOD

Dairy producers need a fermentable silage that can be fed quickly in order to save on storage space and to reduce dry matter losses.

HIGH STARCH CONTENT

Corn silage needs plenty of energy-rich starch to make milk.

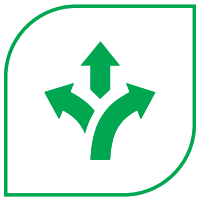


HIGH STARCH DIGESTIBILITY

For maximum availability of starch in the rumen, kernels should break up easily into small particles at harvest and during cow chewing.

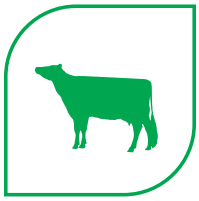
HIGH FIBER DIGESTIBILITY

Dairy Producers need a corn plant that has high NDF digestibility and sufficient effective fiber to promote rumination and rumen retention.



RATION TYPE ADAPTABILITY

A silage hybrid needs to be versatile so that it can be balanced in various rations to satisfy the nutritional needs of all cow groups on the farm.



EXCELLENT FEED QUALITY

Silage in the ration must be palatable and promote healthy rumination, while providing the nutrition necessary to keep a herd healthy and productive.

Grain vs Silage

Breeding has a profound effect on the architecture and behavior of a corn hybrid. As a result of very different breeding goals, ideal grain and ideal silage hybrids have mostly OPPOSING characteristics.

Breeding for Grain

Approximately 92% of corn acres are grown for grain. In order for a grain hybrid to perform, it must have durable kernels that will stay intact during combining, shipping and elevating. These kernels must also dry quickly to save on the cost of mechanical drying. To ensure the successful harvest of a grain crop, breeders select grain hybrids to have stiff stalks that will stand late into the season. These hybrids are also designed to have a relatively high ear placement on the plant for ease of combining. Grain farmers are paid on the basis of kernel integrity, test weight and kernel moisture. To meet this bill, a successful grain hybrid must have three key kernel characteristics: They must have a vitreous, or glass-like kernel type, which makes them hard, tough and heavy. These kernels must be relatively small to further reduce the likelihood that they will fracture during mechanical processing, and they must dry rapidly on the plant as it reaches maturity to save on drying costs. Grain-type hybrids, with their small, fast drying, vitreous kernels, are ideal for delivering high quantities of starch in compact transportable packages to distant markets.

Dual purpose hybrids bred for grain do not make ideal silage. Here's why:

THE STARCH

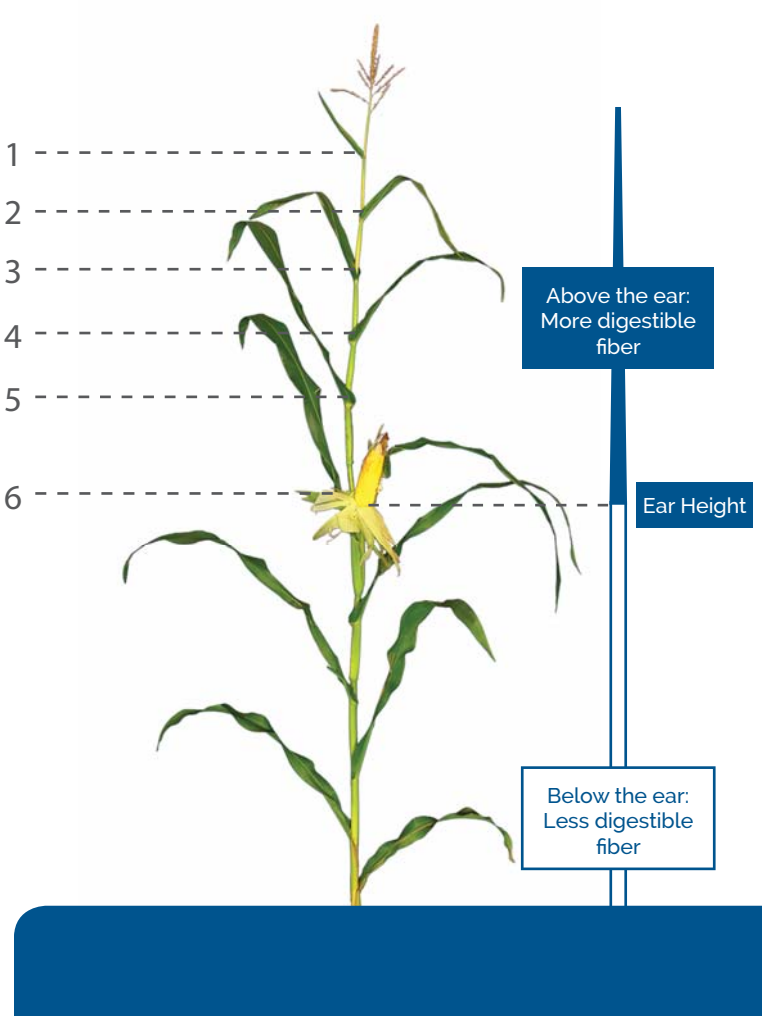
As a grain hybrid reaches silage maturity, its kernels dry rapidly and get very hard. This rapid drying creates a very narrow silage harvest window, which is further complicated by the extended stay green of the grain hybrid's stalk. Often, when the kernels reach a silage appropriate moisture, the plants are far too green and wet to put in the bunker. If the plant is harvested once the plant reaches silage-appropriate moisture levels, the kernels have likely become hard and dry. While the kernels may have a high starch test weight, they remain whole or fracture into large pieces during silage harvest and cow chewing. In this form, much of the starch is unavailable in the rumen for milk production. In order to soften these large hard chunks of starch, a minimum storage period of six months is recommended. This long storage period increases storage space requirements and dry matter losses, and does not guarantee ideal starch quality by the time it is fed. Starch can be made more digestible by processing, but this damages effective fiber and does not consistently reduce starch to a particle size that is comparable with a hybrid that has a more digestible kernel type.

THE FIBER

A successful grain hybrid is bred to withstand the elements until late season harvest, which requires the stalk to be stiff and solid. In addition, its ear must be positioned high on the plant to ensure successful harvest by the combine. Both of these requirements reduce fiber digestibility. The ear is the heaviest part of the plant, so the below ear portion of the stalk must be heavily lignified in order to support it. By raising the ear position and selecting for stiff stalks, grain hybrids produce a high proportion of indigestible fiber.

It can be difficult to harvest a grain hybrid for silage when its stalk is at the appropriate moisture level. It can pass from too wet to too dry rapidly and this reduces silage quality and feed efficiency. Excessively wet or dry silages often result in inadequate fermentation and unstable silage products.

Ideal Grain



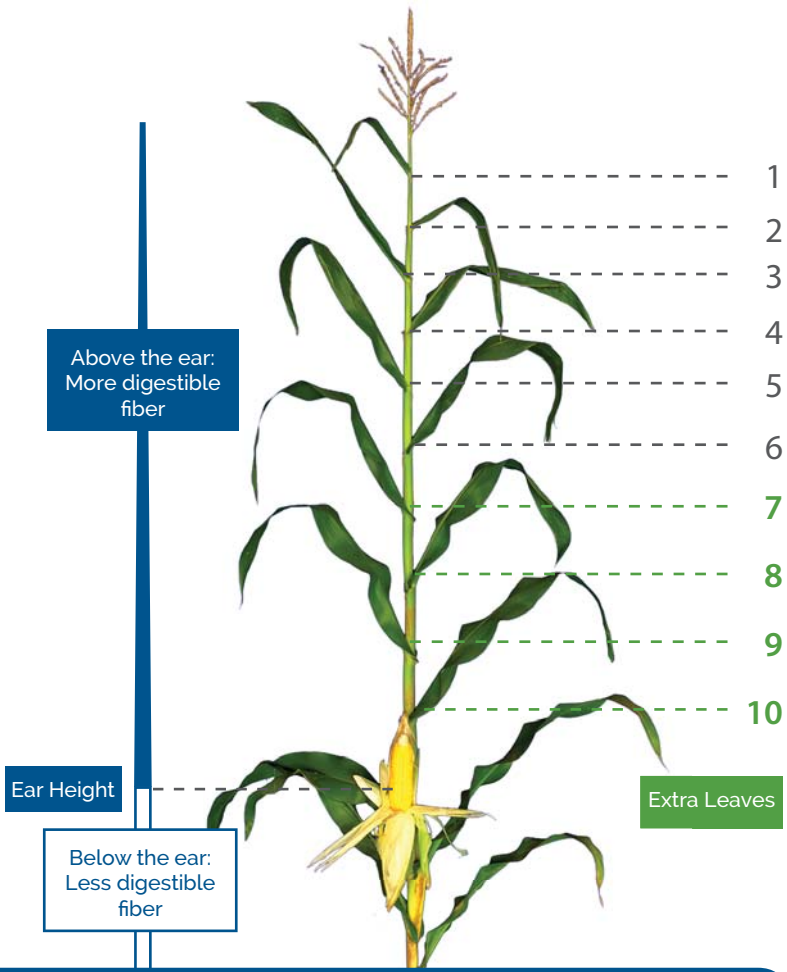
Breeding for Silage

Roughly 8% of corn acres are grown for corn silage. In this application, ideal harvest occurs when the crop has reached 65% moisture and 50% kernel milk line. During this harvest window, the whole plant is cut low to the ground and is chopped into small pieces before being compacted into a silo or bunker, ensiled, mixed into a TMR and fed to dairy cows for a season or more. Given this process, an ideal silage hybrid must satisfy an entirely different set of parameters than a grain hybrid. It must have a high total plant yield of digestible starch and fiber, a long harvest window in which the plant dries to the appropriate moisture and remains there for an extended period, adequate sugars to promote fermentation, and a relatively short storage period to save on space and reduce dry matter losses. Ultimately, a corn silage hybrid must produce a robust, reliable, digestible crop that will promote rumination and readily produce high quality milk when mixed into a TMR and fed to a lactating cow.

Grain hybrids produce tough kernels that remain unbroken during transport while silage hybrids produce kernels that are easily broken and digested.

Choose a hybrid that was bred for silage. Choose a Leafy!

Ideal Silage



	Ideal Grain	Ideal Silage
Yield	High grain yield with high test weight.	High total plant yield of digestible forage.
Kernel Moisture	As dry as possible at grain harvest time.	50% milk line for as long as possible at silage harvest time.
Kernel Hardness	As hard as possible to decrease possibility of breakage.	Soft and easily broken for maximum digestion in the rumen.
Kernel Size	Small to decrease possibility of breakage.	Large to increase possibility of breakage.
Stalk Moisture	Wet to keep plant alive as long as possible to reach ideal grain harvest.	Dries to achieve 65% total plant moisture and stays in that range to extend harvest window.
Stalk Integrity	As stiff and solid as possible for late season grain harvest.	As soft and flexible as possible, yet strong enough to remain standing through late silage harvest.
Ear Height	High position on the plant to ensure harvest by combine.	Low position on the plant to increase proportion of digestible fiber above the ear.
Ideal At Harvest	Wet strong stalk that supports ears of vitreous, hard, dry kernels.	Large plant with a soft stalk and moist ear of large breakable kernels. Stalk and ear dry at a complimentary rate.

Leafy Corn Silage Hybrids

Named after the Leafy gene that produces a distinctive plant with 8 or more leaves above the top ear, the advantages of growing and feeding a Leafy Corn Silage Hybrid begin with these extra leaves. But the benefits don't end there . . .

STRONG AGRONOMICS

Environment and management decisions have an impact on all crops, but Leafy Hybrids offers the grower some unique agronomic benefits in addition to the excellent agronomics that are required of any successful corn hybrid.

- A Leafy has tremendous spring vigor and produces a very thick canopy. This quickly reduces the amount of sunlight that reaches the ground for the competing weeds, even when the Leafy is planted at the recommended 28,000 to 30,000 plants per acre.
- A Leafy is more likely to flex than break in a foul weather event. Leafies have been bred to produce ears that are positioned relatively low on tall flexible stalks.
- Leafies have been selected to resist ear molds that can be responsible for the mycotoxins that ruin feed.

HIGH TOTAL PLANT YIELD

Leafy Corn Silage Hybrids are bred to produce a high yield of digestible fiber and starch. Leafy's extra leaves above the ear increase the leaf area index of the plant, allowing for more sugar production. These sugars are converted to starch in the ear. Leafies have flex-type ears and the extra leaves of a Leafy help to develop and fill those ears with starch. Extra leaves also increase tonnage. A Leafy crop stands taller and fuller than non-Leafy hybrids that are planted in the same location. Leafy Corn Silage Hybrids must be planted at low populations of 28,000 - 30,000 plants per acre to realize their optimal yield, but because each plant produces more dry matter than a dual purpose hybrid, you can realize top yields with less seed.

LONG HARVEST WINDOW

Leafy Corn Silage Hybrids are bred to extend the ideal silage harvest window. They are selected for a slower and complimentary rate of dry down in both the plant and ear components. The whole plant stays near the ideal silage moisture level of 65% moisture and 50% kernel milkline for a longer period of time compared to dual purpose hybrids. Dairy producers are more likely to chop and store the best quality feed with this extended harvest window.

RESEARCH: LONG HARVEST WINDOW

Researchers from Agriculture and Agri-Food Canada conducted a four year study that compared two Leafy Corn Silage Hybrids to two dual purpose hybrids. They found that the Leafies had significantly higher kernel moisture than the dual-purpose hybrids in each of the four years as well as higher maximum kernel dry weight in 2 of the 4 years. They also found that the Leafies declined more slowly in kernel moisture content than the dual purpose hybrids with up to a 6 day difference in kernel moisture change between the two hybrid types. (Dwyer & Ma, 2012)

Researchers at the University of Wisconsin compared a Leafy Corn Silage Hybrid to a dual purpose hybrid in a feed study. They found that "[a]lthough harvested at a similar kernel milkline positioning, the moisture content of LFY was higher than [the dual purpose] at both low and high plant populations." (Bal et al., 2000)

Leafy Corn Silage Hybrids are bred for ideal silage qualities to maximize income over feed costs on a dairy.

HIGH STARCH CONTENT

Leafies are bred to have large, energy-rich flex ears. When planted at recommended population of 28,000-30,000 ppa, a Leafy crop will realize its best starch yield.

SHORT STORAGE PERIOD

Leafy Corn Silage Hybrids can be fed right after fermentation - after about 30 days in the silo. Leafies have been selected to produce large, flat, soft, moist kernels that have more floury starch inside. During silage chopping these kernels fracture easily into small particles which require less starch softening by the lactic acid in the silo before the starch is available for rumen digestion. A Leafy's increased leaf area also has the capacity to convert more sunlight to sugars in the plant during photosynthesis, so their stalks contain more sugars for lactic acid formation in the silo. This shortened storage period allows dairy producers to reduce dry matter losses and storage space requirements.

RESEARCH: PLANT SUGARS & ENSILING

Researchers at the University of Wisconsin compared a Leafy Corn Silage Hybrid to a dual purpose hybrid in a feed study. They found that "[s]ilage pH tended to be lower and lactate concentration higher for LFY than [the dual purpose], which was likely related to its higher moisture and sugar contents." (Bal et al., 2000).

Researchers at the Hungarian Academy of Sciences found that the extra above ear leaves of a Leafy increase the sunlight-absorbing surface of the plant compared to dual purpose hybrids. "Prior to ensiling and before complete physiological maturity, there are still a large number of fresh leaves that contain greater quantities of sugar than those of normal hybrids." (Pinter et al., 2011)

HIGH FIBER DIGESTIBILITY

Leafy Corn Silage Hybrids have three unique characteristics that boost their fiber digestibility:

1. They have a lower ear position on the stalk. The ear is the heaviest part of the plant, so the below-ear portion of the stalk must be heavily lignified to support its weight. By lowering the ear, the more digestible above-ear portion of the stalk is increased while maintaining an adequate below ear stalk for good standability.
2. Leafies that are grown at recommended populations have thicker, more digestible stalks since the proportion of soft inner stalk is increased relative to the lignified outer rind.
3. Leafies have two or more additional leaves above the ear and boast an excellent balance of effective and digestible fiber for the dairy ration, with no need to add straw!

HIGH STARCH DIGESTIBILITY

Leafy Corn Silage Hybrids are bred to have ears with digestible kernels. Unlike grain varieties, a Leafy ear is composed of large, flat, soft kernels that dry down slowly on digestible cobs. The kernels have a higher proportion of floury white starch than the hard, vitreous yellow starch typical of grain kernels. These larger, wetter floury kernels break up easily into smaller pieces during harvest and during the cow's chewing. Smaller starch particles increase the sites of digestion for rumen microbes as well as increase the rumen retention time for a boost in milk production.

RESEARCH: MILK STUDY

Researchers from the University of Wisconsin conducted a feed study comparing a dual purpose hybrid to a Leafy Corn Silage Hybrid. Despite the dual purpose having a higher quantity of starch (40.7%vs 38.8%), they found that: "[w]hen fed as silage, the leafy corn hybrid used in this experiment supported greater DMI as well as higher milk and milk protein yields when compared to the grain corn hybrid." They also observed more 4% FCM. (Clark et al, 2002)

RATION TYPE ADAPTABILITY

Many dairies balance and feed multiple rations for cows that are at different stages of maturity and lactation. A Leafy Corn Silage Hybrid can form the basis of a ration that is fed to heifers, early lactation, late lactation, and dry cows.

EXCELLENT FEED QUALITY

Leafy Corn Silage Hybrids make quality milk and help keep a herd healthy. A Leafy crop planted at recommended populations of 28,000-30,000 ppa should produce a feed with an appropriate balance of digestible fiber and digestible starch for milk production, while providing adequate effective fiber for healthy rumination and efficient rumen retention time.

FEEDBACK

Bart and Laura Klessens own a dairy with 75 Holstein/Jerseys in Southern Ontario where they have been feeding a Leafy Corn Silage Hybrid for three seasons - and milk production is right where they want it to be. Their cows produce an average of 32 liters of milk per day with 3.87% fat. They have enjoyed high silage yields, and are always able to chop within the harvest window. The forage portion of their ration contains about 56% corn silage. Excess is harvested for concentrate corn that is added to calf starter and to the TMR.

Their cows are healthy, fertile and produce milk reliably. Feed is palatable and is not sorted. Besides the milk stats, Laura looks to the manure to assess the digestibility of the TMR. Their cows produce a consistent manure that is not too runny, not too firm, and with no visible kernel passage. And that "smells like money."

RESEARCH: LEAFIES & MILK POTENTIAL

Agriculture and Agri-Food Canada conducted a four year study that compared two Leafy Corn Silage Hybrids to two dual purpose hybrids. They used a TARR test and a Stenvert test to compare kernel hardness of the four hybrids over four years. They found that Leafy silage-specific kernels were "softer at silage harvest time and at maturity than the dual-purpose or non-Leafy silage hybrids," and went on to conclude that "[t]he softer kernels in Leafy silage-specific hybrids indicate that under the same ensiling conditions, there would be more digestible energy produced from kernel starch than from non-Leafy dual-purpose hybrids. (Dwyer & Ma, 2012)

A feed study at the W.H. Miner Agricultural Research Institute compared a dual purpose hybrid to a Leafy Corn Silage Hybrid. They found that the dual purpose hybrid had a higher proportion of grain (40.6%) than the Leafy (37%), but that the grain of the Leafy was more digestible. It had a higher in vitro true DM disappearance than the grain of the dual purpose hybrid and higher in vitro neutral detergent fiber digestibility (IVNDFD) before and after ensiling. Cows that were fed the Leafy ration produced higher quantities of milk, 3.5% FCM, milk CP and milk lactose compared with cows that were fed the dual purpose TMR. (Thomas et al., 2001)

Researchers at the University of Wisconsin compared a Leafy Corn Silage Hybrid to a dual purpose hybrid in a feed study. They found that "[t]otal-tract digestibility of dietary starch was higher for leafy compared with conventional corn hybrids." This was possibly related to higher grain moisture content or softer kernel texture for LFY." The researchers calculated that 86% of the starch from the dual purpose hybrid was digestible and that 93 % of the Leafy starch was digestible. They also found that "there was a trend for higher milk fat percentage for LFY compared to CH (conventional hybrid)." (Bal et al., 2000)

Plant Population for Leafies

Leafies and Floury Leafies have a different plant architecture and the key to realizing all of their silage-specific benefits is a lower plant population of 28,000 to 30,000 plants per acre.

HOW DOES LEAF AREA TRANSLATE INTO YIELD?

A corn plant's leaves are the factories that convert sunlight to yield. The chloroplasts within leaf cells produce glucose sugars during photosynthesis. This sugar energy is used for plant growth and development while the plant is young. After the plant reaches flowering, these sugars are transported to the developing kernels on the ear to become starch. Starch accumulation is fueled primarily by the above ear leaves, which receive the most sunlight once the plant is grown to full height, while the early growth of the plant was achieved by the below ear leaves, which become shaded as the plant grows.

The yield potential of a corn crop is related to its leaf area index, which is the one-sided green leaf area per unit of ground surface area. The leaf area index of a corn crop can be maximized by increasing plant population or by increasing leaf area on a per plant basis. Grain corn hybrids produce a maximum of 5-7 leaves above the ear, so these hybrids are planted at a high population of 33-36,000 plants per acre (ppa) to maximize their leaf area index. Leafy Corn Silage Hybrid plants have 8-13 leaves above the top ear, so they have an increased leaf area on a per plant basis. Because Leafies are larger plants, they need more room to produce their intended crop. To achieve this, they must be planted at a lower population of 28,000-30,000 ppa. Leafy Corn Silage Hybrids have an increased potential over non-Leafy hybrids to produce high starch yields on a per plant basis because of their high leaf area combined with their flex ear type.

RESEARCH: PLANT POPULATION

A Penn State University population study compared a Leafy hybrid to a dual-purpose hybrid and concluded that Leafies "may have lower optimum populations than normal hybrids. Leafy hybrids may also have lower starch levels and whole plant digestibility at higher plant populations, which would also support the recommendation for reduced plant populations for leafy hybrids." (Roth et al., 2000)

Figure 1 shows the typical stature of a grain hybrid and a Leafy Corn Silage Hybrid. Note the number of leaves above the ear (LAE), the size of these leaves and the position of the ear. The Leafy Corn Silage Hybrid has 10 LAE compared to 6 LAE on the grain plant.

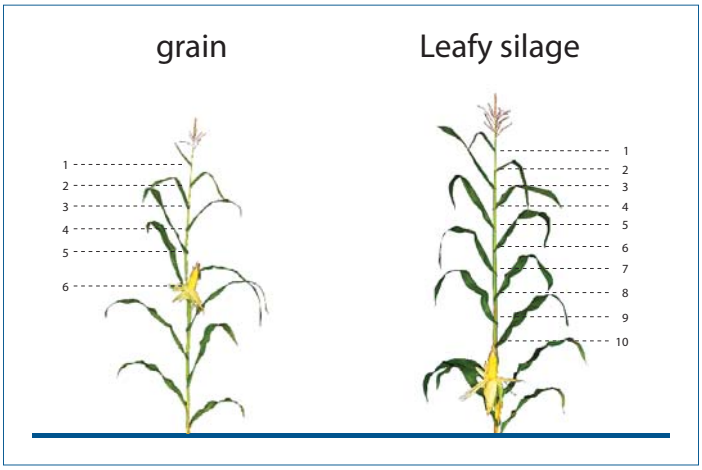


Figure 1

Figure 2 shows the difference in leaf area between the two plants. The four leaves highlighted in red just above the ear are the extra leaves on the Leafy Corn Silage Hybrid. This Leafy plant has 70% more leaf area above the ear than the grain hybrid. The ear position on the Leafy is lower than the grain hybrid, so the Leafy has about 40% more total leaf area than the grain hybrid.

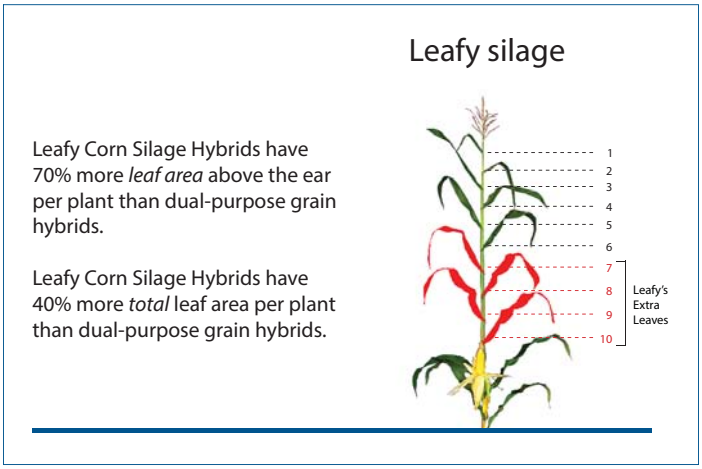


Figure 2

COMPARING APPLES TO APPLES

The dominant industry message is to plant all corn hybrids at high populations in order to maximize silage yield. While this advice is well-taken for grain hybrids, it is detrimental to a Leafy Corn Silage crop to plant it at the high populations recommended for grain. Table 1 below takes into account the higher leaf area of a Leafy Corn Silage Hybrid and compares that to the population density of a grain hybrid.

Leafy planted at	*is comparable to*	*Grain planted at*
25,000 ppa	x 40% more leaf area	35,000 ppa
28,000 ppa	x 40% more leaf area	39,000 ppa
35,000 ppa	x 40% more leaf area	49,000 ppa

Table 1

When leaf area is accounted for, you can see that planting a Leafy Corn Silage Hybrid at 35,000 ppa gives a comparable canopy to the grain hybrid at 49,000 ppa. Planting the Leafy at 28,000 ppa gives the same leaf canopy as the grain hybrid at 39,000. To achieve the equal leaf area canopy as a grain hybrid that is planted at its recommended population of 35,000 ppa, the Leafy would be planted at 25,000 ppa.

POPULATION AFFECTS YIELD

Leafy Corn Silage Hybrids have been bred and tested for the market since 1989. In that time, numerous population studies have been conducted on the best hybrids. They have suffered hot dry seasons and experienced major weather events with high winds and heavy rains. What has been discovered is that plants with 8-9 LAE achieve maximum yields at 30,000 ppa. For plants with 10-11 LAE, maximum yields result when they are planted at 28,000 ppa. At 28,000 to 30,000 ppa, Leafy Corn Silage Hybrids have strong roots and good drought response. They also produce a crop with excellent feed qualities – high starch and a good proportion of digestible fiber. At these populations Leafies are higher-yielding than grain hybrids that are planted at 35,000 ppa by about 10%.

Plant at 30,000 ppa for Leafies with 8 to 9 leaves above the ear and at 28,000 ppa for 10 to 11 leaves above the ear.

BALANCING YIELD WITH QUALITY

When we plant a Leafy Corn Silage Hybrid, we are growing FEED that must be digested to produce MILK, so we aim to grow this crop at the population that will produce the highest quantity of dry matter with the highest grain yield and best fiber digestibility, while achieving the best crop security. In our population studies, we have seen that in average conditions, the YIELD of a 10-11 LAE Leafy will not be different between 28,000 and 32,000 ppa, and will often be less at 36,000. But when we look at the difference in the QUALITY of the feed that is produced at different populations, we see that maximum grain yield and digestible fiber is achieved at the lower 28,000 ppa. For 8-9 LAE Leafy hybrids, this number is 30,000 ppa. Feed quality affects milk production potential.

Figure 3 (next page) illustrates the differences between the same Leafy Corn Silage Hybrid planted at 28,000 ppa and 35,000 ppa at the same location.

At 28,000 ppa, the hybrid produced large ears and thick stalks. At 35,000 ppa the ear and stalk size declined. As the stalk size declines, so too does its digestibility.

RESEARCH: PLANT POPULATION

During a feed study, researchers at the University of Wisconsin harvested a Leafy Corn Silage Hybrid at a low population of 24,000 plants per acre (61,000 plants per hectare) and 32,000 ppa (79,000 pph). They found that "NDF was highest and starch lowest for LFY at the high plant population." (Bal et al., 2000)

According to the Agricultural Research Institute of the Hungarian Academy of Sciences, Leafy Corn Silage Hybrids, on average, have 30-40% more leaf area than non-Leafy plants. "The higher number of leaves above the ear means that they can shade each other more than those of non-Leafy hybrids. As a consequence, choosing the optimal plant density is a very important factor in the production of Leafy hybrids." (Pinter et al., 2011)

It is essential to grow Leafies at their intended populations. Increasing density can alter flowering dates and maturity, drought response, standability and overall plant composition, all of which affect the feeding value of the silage product.

SELECT THE BEST CORN SILAGE FOR YOUR DAIRY

Selecting a corn silage hybrid based on its performance in State Trials should be a no-brainer. Unfortunately, these trials are planted at a population that is much too high for Leafy Corn Silage Hybrids. All states publish their comparative yield data based on trials that were planted at 33-35,000 ppa. As we know, when the Leafy is planted at this population, it is comparable to planting a grain hybrid at 49,000 ppa. How would a grain hybrid do at 49,000 ppa? You have seen higher populations when the rows on headlands come closer together. Plants are thinner, ears are smaller, they mature more rapidly and if you look at the amount of grain in the whole plant community, it is much lower than where the rows are regularly spaced. The high population community has a low grain to stover ratio and the plants are very susceptible to drought stress, fertility stress, and root lodging. You would NEVER grow that grain hybrid at 49,000 ppa. In State Trials, the data that is produced on Leafy Corn Silage Hybrids grown at 33,000-35,000 ppa does not reflect performance at their intended population.

In State Trials where the Milk 2006 formula is used to calculate milk per ton, the Leafy Corn Silage Hybrids show less starch and milk per ton, though they generally still have competitive yield per acre. In our trials we grow dual-purpose hybrids at their recommended population of 35,000 ppa and Leafy Corn Silage Hybrids at their population of 28,000 ppa, in three row plots. We harvest only the center row to get the best comparable data. In these population-sensitive trials, the Leafies show their undeniable advantage in milk per ton and milk per acre.

Take our well-researched advice: plant your Leafy Corn Silage Hybrid at the population that will produce the largest quantity of high quality feed for milk production **– 30,000 ppa for 8 to 9 LAE hybrids and 28,000 ppa for 10 to 11 LAE hybrids –** and get the added benefit of buying less seed. All you need to do is change that planter population setting. When you plant a Leafy Corn Silage Hybrid, less is certainly more.

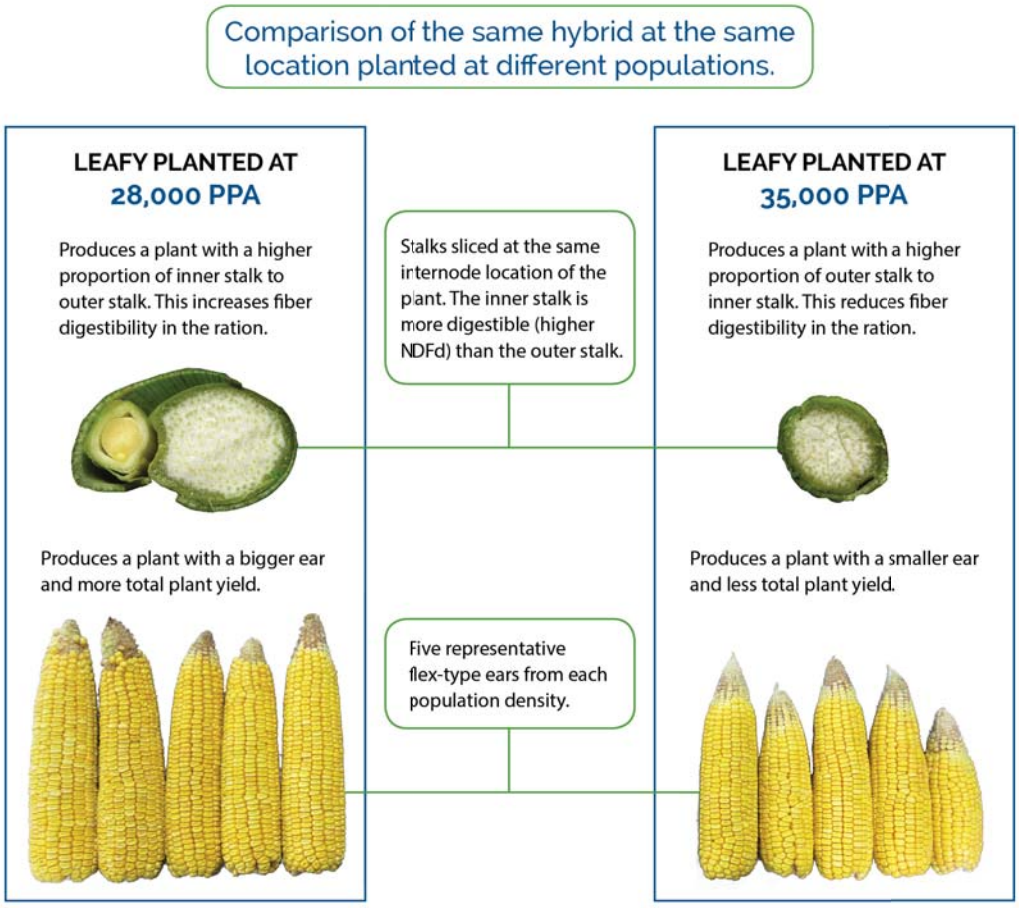
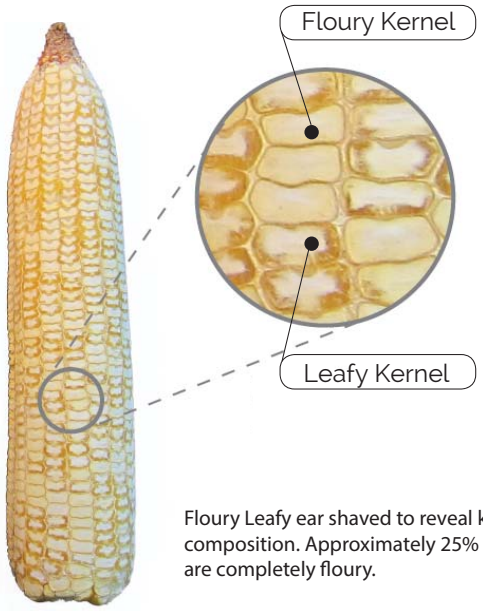


Figure 3

Floury Leafy Corn Silage Hybrids

Featuring the same silage specific characteristics as Leafy Corn Silage Hybrids, but with more rumen-available starch for milk production. Increasingly, starch QUALITY is being recognized as the key to higher milk yields!

Floury Leafy Corn Silage Hybrids have a silage specific kernel type that behaves differently in the field, the chopper, the silo and the rumen. They contain a naturally occurring recessive gene called opaque-1. In the farmer's field, a segregation of kernel type is seen on the ear. Approximately 25% of the kernels on each ear have completely floury interiors. The other 75% of the kernel set is composed of normal Leafy type kernels. All kernels are selected to be large, soft, and slow drying so that they will fracture easily during chopping and cow chewing for maximum starch digestibility.



Floury Leafy ear shaved to reveal kernel composition. Approximately 25% of the kernels are completely floury.

Fresh Chopped Floury Kernel

Fermented Floury Kernel

Mature Floury Kernel, split in half

When you move your herd to a Floury Leafy ration, reduce the concentrate corn in the TMR. Expect starch to be 10 to 12% more digestible.

RESEARCH: MILK STUDY

Researchers at the University of Wisconsin conducted a milk study that compared a Floury Leafy (LFY) to a bmr hybrid. They found that "the starch portion of LFY was more digestible than BMR as observed by ruminal in vitro and in situ starch digestibility coefficients." They found that the Floury Leafy had a "10 percentage unit greater ruminal in situ starch digestibility coefficient (12 h) ... compared with BMR." They also found that "kernel vitreousness was more than 2-fold greater for BMR than LFY (90.0 vs. 37.5%)" and that "starch digestibility of the BMR was inhibited by vitreousness." They concluded that their results "imply that [silage] hybrid selection programs, which focus on increasing starch digestibility by dairy cows through selection of softer kernel texture, are feasible."

While the bmr ration had a higher DMI and produced more milk than the LFY ration, researchers found that the LFY ration had the same feed conversion as the bmr ration and it produced milk with a higher concentration of fat. [M]ilk fat content was greater for cows fed LFY (4.05%) than BMR (3.83%)." They also found that "total-tract starch digestibility was greater for cows fed the LFY corn silage." Unpublished data showed that the LFY yielded 11% more DM than the bmr. (Ferraretto et al., 2015)

Table 4. Effect of treatment on covariate-adjusted least squares means for intake and lactation performance[1,2,3]

Item	BMR	LFY	SE	*P*-value
Intake				
DM, kg/d	28.1	26.4	0.4	0.01
DM, % of BW	3.82	3.64	0.05	0.01
OM, kg/d	24.7	23.2	0.4	0.01
NDF, kg/d	7.9	7.7	0.1	0.10
Starch, kg/d	6.1	5.5	0.1	0.001
CP, kg/d	4.7	4.2	0.1	0.001
Yield				
Milk, kg/d	49.0	46.8	0.8	0.05
3.5% FCM, kg/d	50.8	49.7	0.8	0.20
SCM, kg/d	46.8	45.3	0.7	0.06
ECM, kg/d	50.5	49.0	0.7	0.07
Milk component				
Fat, %	3.83	4.05	0.07	0.01
Fat, kg/d	1.84	1.84	0.04	0.89
Protein, %	3.27	3.27	0.08	0.98
Protein, kg/d	1.57	1.48	0.03	0.03
Lactose, %	4.87	4.81	0.03	0.06
Lactose, kg/d	2.35	2.19	0.05	0.01
MUN, mg/dL	15.6	16.8	0.3	0.001

[1]Treatments were diet containing brown midrib (BMR) or leafy-floury (LFY) hybrid.
[2]Week effect ($P < 0.01$) for milk fat, protein, lactose, and urea-nitrogen concentration and lactose yield.
[3]Nonsignificant ($P > 0.10$) week × treatment interaction for all parameters.

SMALL PARTICLE SIZE

Floury kernels fracture easily into small particles during silage chopping, allowing for a shortened storage period. After chewing, the starch is readily digested and available as energy for milk production.

LONG RUMEN RETENTION

Nutritionists believe that floury starch particles are more buoyant in the rumen and float to stay in the rumen mat for an extended digestion period resulting in increased milk production potential.

HIGH ENERGY STARCH

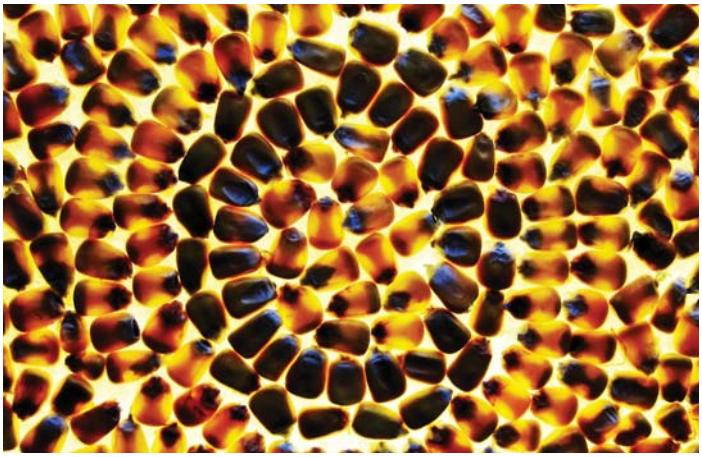
The small starch particles offer more surface area to rumen bugs for a boost in digestibility. This increase in energy in the corn silage allows for a reduction of concentrate corn in the ration.

RATION-TYPE ADAPTABILITY

Floury Leafy Corn Silage Hybrids are versatile. They can be balanced into various rations types to meet the nutritional needs of your heifers, transition cows, early and late lactation cows and dry cows.

HIGH QUALITY MILK

Floury Leafy Corn Silage Hybrids have an increased potential to produce milk with high fat content. They do not require heavy kernel processing during harvest to reduce starch particle size, so fiber particles can remain large enough to act as effective fiber. This promotes normal rumination and saliva production, which plays an important role in protection from acidosis and increases milk fat content.



Vitreous and floury kernels on a light table. Vitreous kernels transmit light while floury kernels are opaque.

10 Ways to Boost Your Bottom Line

Leafy and Floury Leafy Corn Silage Hybrids deliver increased income over feed costs in sophisticated ways. The key is in the synergy between their silage specific characteristics.

1 **PLANT 20% LESS SEED**
Plant your Leafy at 28,000 - 30,000 ppa to produce the optimal silage crop. You'll need to plant a dual purpose hybrid at 35,000 ppa to get its best yield.

2 **MAXIMIZE TONNAGE**
At 28,000-30,000 ppa, Leafies tend to produce the same or higher yields of DM per acre than dual purpose and BMR hybrids planted at 35,000 ppa.

3 **MAXIMIZE YOUR HARVEST WINDOW**
With a Leafy, you're more likely to chop and store your best silage crop and avoid added costs of trying to salvage silage that was harvested too dry. Leafies dry slowly for silage security.

4 **PAY LESS FOR CUSTOM CHOPPING**
Leafies produce large, moist kernels that are designed to break-up during chopping. Ease off on the kernel processor to speed-up harvest. You'll save money and retain effective fiber.

5 **REDUCE STORAGE SPACE BY 25%**
Soft starch type and high sugar content at harvest allow Leafies to be fed as soon as 30 days after harvest, or as soon as fermentation is complete. That's five months sooner than dual purpose and BMR hybrids. You'll need less silage on hand and that frees up a lot of space.

6 **MINIMIZE DRY MATTER LOSSES**
Leafy's shorter required storage time can reduce dry matter losses and retain silage quality. Lose less, feed more.

7 **REDUCE KERNEL PASSAGE & SORTING**
Leafies and Floury Leafies have been shown to have more digestible kernels than dual purpose and BMR hybrids. When you feed a Leafy, more starch will be used as fuel. And because it fractures into small particles, it is less likely to be sorted during feeding.

8 **REDUCE ADDITIVES**
The increased starch digestibility of Leafy and Floury Leafy Corn Silage Hybrids allows for a reduction in concentrate corn in the ration over a dual purpose or BMR, and you'll never need to add straw to gain effective fiber.

9 **ENJOY HIGH MILK PRODUCTION**
Leafy and Floury Leafy Corn Silage Hybrids have been shown to produce high quantities of milk in feed studies. They are competitive in feed efficiency and milk production relative to competing products.

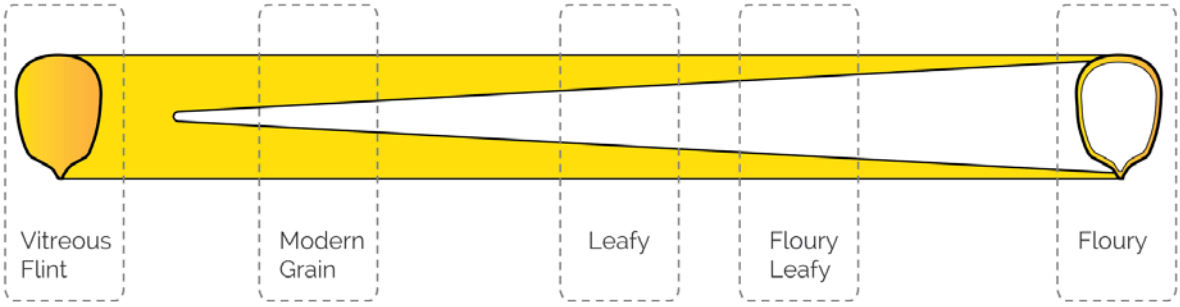
10 **INCREASE 3.5% FAT CORRECTED MILK**
In feed studies, Leafy and Floury Leafies have been shown to produce milk with a higher percentage of milk fat than dual purpose hybrids and BMRs, and depending on how you sell your milk, this could be a big bonus.

Hybrid Type Comparison

Why choose one great silage characteristic when you can have them all?

Many silage products boast only one quality of the plant, such as fiber digestibility, grain yield or kernel type. Chances are that the other characteristics of these hybrids were bred for grain. The best silage products have been bred to achieve total plant silage qualities. Expect more from your silage crop.

	Dual Purpose	BMR	Leafy	Floury Leafy
Strong Agronomics	●		●	●
High Total Plant Yield	●		●	●
Long Harvest Window			●	●
Short Storage Period			●	●
Ration Type Adaptability	●		●	●
Excellent Feed Quality		●	●	●
High Fiber Digestibility		●●	●	●
High Starch Content	●	●	●	●
High Starch Digestibility			●	●●



LEFT: Dual purpose hybrids have a modern grain type kernel with more vitreous starch, while Leafy and Floury Leafy Corn Silage Hybrids have more floury kernel types.

Frequently Asked Questions

Q **Why does my Leafy field have an uneven canopy? Is it mixed with another hybrid?**

A An uneven canopy is an identifier of a Leafy crop. The Leafy gene produces plants that have eight or more leaves above the top ear. If, for example, you have planted a hybrid that averages 10 leaves above the ear, there will be plants in your field that have 11, 12 or 13 leaves. The Leafy gene can be a bit wild like that. Worry not! These extra leaves will add dry matter, and the plants with higher leaf numbers will flower slightly later than the rest of the population for an extended period of pollen shed. This is added assurance of good kernel set.

Q **Do you recommend that I apply a silage inoculant to my Leafy or Floury Leafy?**

A Leafy Corn Silage Hybrids generally contain more sugars in their stalks and leaves at silage harvest time due to their increased leaf area above the ear and their extended harvest window. These sugars are converted to lactic acid by the naturally present lactobacilli under anaerobic conditions in the silo. The presence of these extra sugars is thought to lead to a more even fermentation. While a well-packed Leafy crop may undergo better fermentation without an inoculant than a non-Leafy, the application of an inoculant adds silage security. Some inoculants also help to preserve dry matter in the open face of a bunker. For added insurance value, we recommend that a silage inoculant be applied at harvest.

Q **Are there any special considerations that my nutritionist and I should be aware of when designing a ration with a Leafy or Floury Leafy?**

A Yes. Ease back on the concentrate corn initially. Both hybrid types have a starch that is more digestible. Expect your Leafy to be 5-7% more digestible than a conventional and for your Floury Leafy to be 10-12% more digestible. Watch your herd and add concentrate corn back in slowly if needed.

Q **My Leafy or Floury Leafy yielded really well, and I have some left over. What can I do with it?**

A If you've read the section on grain versus silage, it should be no surprise that these silage specific hybrids are not great grain hybrids. Their kernels are very slow drying and are designed to break. While we don't recommend that they are harvested for commercial grain, some farmers have done it successfully. Others have harvested it to feed as concentrate corn on farm. Just give them extra time to dry out and make sure to watch stalk integrity. These hybrids make excellent high moisture corn.

Q **I'm considering planting a Leafy or Floury Leafy, but it doesn't look great in competitive yield trials or with MILK2006. What gives?**

A Most yield trials are planted at populations that are much too high for Leafies. While the Leafy may produce high tonnage, under these conditions the Leafy will produce less starch and more lignin and will probably have some agronomic issues such as root lodging. A Leafy must be planted at a low population of 28,000-30,000 to yield its highest quantity of high quality silage. The milk per ton or milk per acre numbers that are generated from these trials are the result of measuring an inferior Leafy crop planted at 35,000 ppa. Neither calculation takes into account the added starch digestibility of the Leafy or Floury Leafy Corn Silage Hybrid, nor the other silage specific benefits that Leafies offer.

Q **How can I boost the feed quality of a Leafy or Floury Leafy ?**

A Leafies and Floury Leafies are high-yielding plants that have a large proportion of their total plant above the ear for a natural boost in fiber digestibility. You can further increase the fiber digestibility and the proportion of starch in the ration by raising the cutting bar during chopping.

Grow. Chop. Feed.

CHOOSE YOUR HYBRID

Great, you've decided to plant a Leafy! Choose the best one for your dairy by knowing your maturity zone and which traits you need (if any). Floury Leafies offer all of the features of a regular Leafy with the addition of more digestible starch, however, they're available with fewer traits.

CALCULATE SEED NEEDS

Plan for your Leafy to yield at least as many tons per acre as any hybrid that you've planted in the past. Calculate your seed needs based on a seeding rate of 28,000 - 30,000 ppa.

SELECT THE FIELD

Leafies perform best when planted on well-drained, nutrient-dense soils in a crop rotation. They do not require your best soils, but will reward you if they are provided.

ISOLATE A FLOURY LEAFY

Plan to plant a Floury Leafy separately from a Leafy and all other Corn Silage Hybrids in order to get the full 25% expression of its floury kernel type. Pollen from other hybrids will suppress the expression of the floury kernel type. Note: pollen from the Floury Leafy **will not** make floury kernels in any other hybrid. We recommend 300 feet to the nearest non-Floury Leafy corn field.

Can't get the recommended isolation?

No problem. Maximize your floury kernels with the space you have:

1. Plant in wide blocks to reduce contact between hybrid types.
2. Work with prevailing winds. Plant your Floury Leafy to the west.

300ft for 25%

PLANT

Plant at 28,000-30,000 ppa and never mix with a non-Leafy in the field. Other hybrid types require higher populations, have shorter harvest windows and will produce vitreous kernels that require a longer ensiling period. Always plant different hybrid types in separate blocks.

28-30,000 ppa

Care for your Leafy as you would any other corn hybrid. Apply nitrogen. Manage weeds. Wait and Enjoy!

CHOP

Once your Leafy reaches 50% milk line and 65% plant moisture, it's time to chop. If using a kernel processor, ease off. A Leafy's kernels are designed to break and it is essential to retain effective fiber for rumen function. Monitor kernels during chopping and find the balance. Making shredlage is an excellent option as well. Apply the inoculate of your choice.

Always harvest and store a DUAL PURPOSE hybrid separately. Ideally it should be chopped last so that acres left standing can be harvested for grain. It should also be stored so that it can be fed after the Leafy since it needs a longer ensiling period.

STORE

Leafies generally contain a higher quantity of sugars in the stalk and leaves at harvest. These sugars improve ensiling speed and quality. Starch fractures easily into small particles during harvest and cow chewing, so new crop silage can be fed as soon as fermentation is complete!

30 days

Have extra? Harvest your Leafy for high moisture corn!

FEED

Leafy silage is versatile and can be balanced in various ration types. Expect your Leafy to have 5-7% more starch digestibility and your Floury Leafy to have 10-12% more starch digestibility than a dual purpose hybrid. When moving a herd from a conventional or a BMR to a Leafy or Floury Leafy, reduce concentrate corn and slowly increase as required. Eliminate straw. Watch your herd and adjust the rations as needed.

Leafy Corn Silage Hybrids and Silage Testing

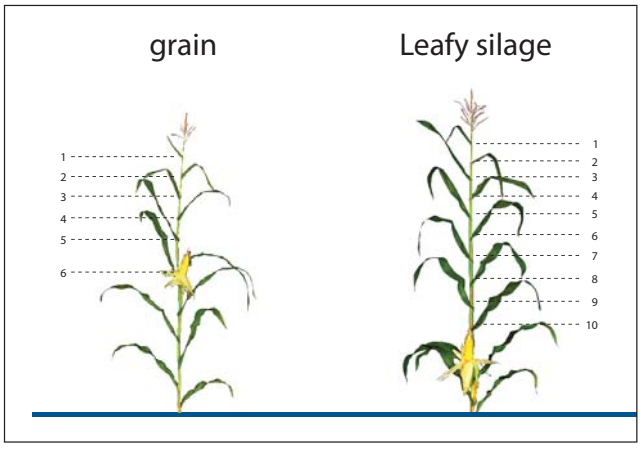
Many of you have experienced the benefits of growing and feeding a Leafy - whether on your own farm or on those of your neighbors or customers. You see its high yields, wide harvest windows, and excellent feed qualities that translate into high milk and meat yields. But when it comes to pulling a silage report or generating yield trial data that will convey the virtues of growing and feeding a Leafy, you're hard-pressed to find your proof. The reality is that silage tests were built to compare grain hybrids to one another. Leafies are so different from grain-bred dual purpose hybrids that current industry standard tests and equations create an uneven playing field that obscures the value of growing and feeding Leafies.

YIELD TRIALS

State Trials, University Trials, Official Trials and Private Yield Trials seek to subject each corn hybrid under evaluation to the same conditions to create quality data for hybrid comparison. The hybrids that produce top yields or the best MILK2006 rankings are sought-out by progressive dairy farmers who make research-based management decisions to maximize the productivity of their acres and cows. NIRS and wet chemistry analysis are also widely used to determine forage quality. But when a Leafy or Floury Leafy Corn Silage Hybrid is subjected to these tests, it disappoints, and there are several reasons why:

Plant Population

In order to create comparable data, researchers plant each hybrid at the same population - one that is appropriate for grain hybrids. Compared to a Leafy, grain hybrids are relatively small plants and have generally been bred to have erect leaves so that they can crowd together. Leafy Corn Silage Hybrids have about 40% more leaf area per plant than a dual purpose hybrid, so planting a Leafy at a population of 35,000 plants per acre (78,500 pph) would be like planting a grain hybrid at 49,000 plants per acre (122,500 pph). When Leafies are planted at this high population they produce less starch, more indigestible fiber, have poorer stalk integrity and more drought sensitivity. They still tend to yield well in dry matter, but the feed quality is diminished. Plant population is a big deal for success with a Leafy.

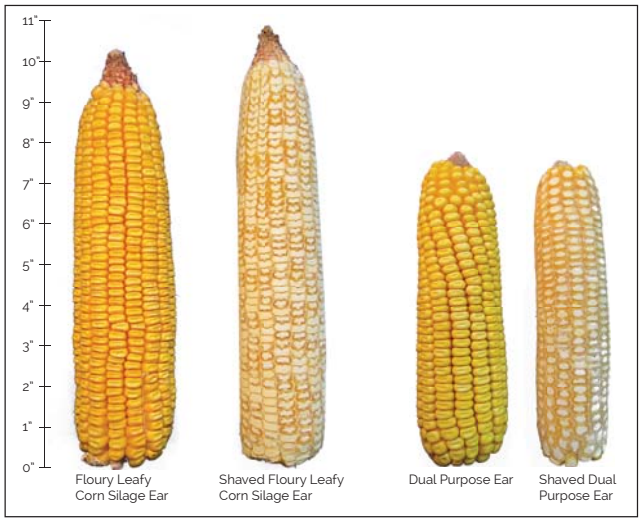


The solution is to evaluate all Leafy Corn Silage Hybrids at a population of 28,000 - 30,000 plants per acre, or 70,000 - 75,000 plants per hectare.

NIRS ANALYSIS (NEAR INFRA-RED SPECTROSCOPY)

Research silage trials are often evaluated by a research chopper that is outfitted with NIRS. NIRS is widely used because it allows for rapid and relatively inexpensive determination of nutrients and characteristics of a forage plot. This tool works by exposing chopped silage to a near infra-red light and recording how much light is reflected by its components. NIRS instruments are calibrated based on carefully selected reference samples that have been previously assayed by wet chemistry or non-NIRS methods. In this way, the NIRS instrument is programmed to translate the light reflectance of the components of each plot sample into its characteristics and nutrients - dry matter, moisture, NDFd, protein, and starch, to name a few.

The numbers that NIRS generates are largely comparable with one Leafy and Floury Leafy exception - the starch. When planted at the **correct population**, Leafy and Floury Leafy Corn Silage Hybrids produce ENORMOUS ears. However, when these hybrids are assessed by NIRS, the starch number comes back disappointingly low. Where does it all go?



Take a look inside the kernels of a Floury Leafy and a dual purpose hybrid. Shave below the kernel caps of each ear and you'll see that the two hybrid types have very different kernel compositions. The dual purpose hybrid produces kernels that are largely vitreous - or glass-like. As the name suggests, these glassy yellow kernels largely TRANSMIT visible light through them. They also contain a small quantity of floury starch. A Floury Leafy produces a large proportion of floury starch and much less vitreous starch. This floury starch largely ABSORBS visible light.

There are two challenges in measuring floury type starch with NIRS

First, all NIRS instruments use vitreous grain-bred hybrids as the basis for their calibrations. When they encounter floury starch, it is not recognized and the starch number comes back low. In order to recognize floury starch, the underlying calibration must be modified to include floury starch samples that have accurately identified this starch type.

The second challenge is the ability an NIRS instrument to "see" all of the starch. When a grain-type kernel travels through a chopper, it fractures into a few large chunks. These are easy for the instrument to read. A floury kernel is moist and soft, so it breaks easily into small particles during silage chopping. These particles smear all over stalk and leaf fragments and much of the starch is hidden from the light that is emitted by the NIRS instrument, making it invisible for its analysis.

Floury Leafy kernels are largely pulverized during chopping, leaving a light starch paste over the other plant fragments. You won't see a lot of yellow in the bunker, and that's a great thing for starch digestibility!

NIRS is tool for measuring dry matter, moisture, protein, fiber and fiber digestibility of a corn silage hybrid, but fails to accurately assess the starch content of Leafy and Floury Leafy Corn Silage Hybrids. This is unlikely to be remedied in the near future.

CAN WET CHEMISTRY MEASURE STARCH CONTENT AND STARCH DIGESTIBILITY?

After a corn silage plot has been chopped, a small sample is sent to a lab where it is dried and ground before it is tested. Unfortunately these three steps lead the test results to be based on a product that is very different from the feed that is consumed by the cow. The problems with these steps are below:

Step 1: a small sample is taken

The difficulties of taking representative and comparable silage samples are widely acknowledged in the research community. This is because corn silage is chopped into medium-sized pieces that are mixed inconsistently. The smaller the sample that is submitted, the more unlikely it is to be representative of the total pile. We have found that if multiple samples are submitted from the same pile of silage, there are usually differences between test results.

Step 2: the sample is dried

Drying is used as a laboratory process only, as cows are fed wet silage. Drying the sample alters its physical properties. It appears that floury starch becomes less digestible and more difficult to identify as starch in wet chemistry analysis after it has been dried - especially at high temperatures.

Step 3: the sample is ground

Labs grind the sample to create a uniform and representative product to use in multiple test repetitions, but grinding makes the starch of vitreous kernels appear to be more digestible than it is in reality. A cow is not able to fine-grind the kernels that she is consuming. By grinding, hybrids with vitreous kernels show higher starch digestibility numbers than they should. Grinding makes the differences between vitreous and floury starch types appear to be much smaller than would be experienced in feeding.

At the lab, samples are ground for both NIRS and wet chemistry tests.

WHAT ABOUT MILK2006?

Milk2006 is a great tool for helping dairy operators and their nutritionists identify the best grain-bred dual purpose hybrid to feed to their cows, but since it is generally applied to yield trials that were planted at high populations, and works with NIRS starch results, a Leafy or a Floury Leafy Corn Silage Hybrid won't be appreciated for its worth. In addition, these tests evaluate starch QUANTITY, not starch DIGESTIBILITY, which is vital for milk production.

HOW SHOULD I EVALUATE A LEAFY?

Leafy and Floury Leafy Corn Silage Hybrids can be accurately yield tested if they are planted at a population of 28,000 - 30,000 plants per acre (70,000-75,000 pph). At this population they should produce maximum yields of digestible fiber and starch. They will have good drought tolerance, good stalk quality, and good flowering synchrony - which is important for producing high quantities of starch. At this population, it is appropriate to compare Leafy and non-Leafy hybrids with NIRS, but don't put much faith in the starch numbers. How did the dry matter compare? How about fiber digestibility? Take a look at the moisture content relative to the other plots that were harvested. The moistures should be similar between hybrids for data to be comparable.

Visit a demonstration plot or a neighbor's field where you can see a Leafy grown at 28,000 - 30,000 ppa (70,000-75,000 pph). You'll see that these hybrids produce enormous ears. Break one in half and pop a few kernels in your mouth. They will be large and flat, tasty and easy to chew. If possible take a look at a pile of chopped Leafy silage. It will be full of broken kernels, though much of the kernels' contents will be smeared over bits of leaf and stalk, forming a light white paste. You'll see that the starch is there even if the NIRS test results would tell you otherwise.

Compare the Leafy to a grain-bred hybrid that is growing nearby. You'll see that the Leafy is much taller, more robust, and produces a larger ear and a thicker stalk. Flex the two hybrids back and forth. You'll feel that the Leafy moves more fluidly - like its fiber would be more digestible. Break open an ear of each hybrid. Examine the kernels, feel them, chew them, taste them. Which kernel type feels more digestible to you?

Talk to a neighbor who has been feeding a Leafy Corn Silage Hybrid to his cows. Ask him about his seed costs, silage yields, the crop's harvest window, his milk yields and cow health. What is his income over feed cost? Why does he trust a Leafy to nourish his livelihood year after year?

Try out a Leafy or a Floury Leafy on a portion of your acres. Chop it, store it and feed it separately from your dual purpose. You'll see the difference in tons per acre at harvest and in milk yield and quality when you switch to the Leafy or Floury Leafy ration. Let your cows tell you which hybrid type is best.

The benefits of growing and feeding a Leafy or Floury Leafy Corn Silage Hybrid can boost your bottom line at every stage of the process - from planting less seed in the spring, to enjoying novel agronomic advantages, high yields, a long harvest window and a short storage period. And importantly, Leafies make excellent feed. With a Leafy, you can expect more from your silage hybrid.

Matt Jones of Renaissance Nutrition stands with a Floury Leafy Corn Silage Hybrid that averaged 31 tons per acre in Hudson Falls, NY.

TEST RESULTS INFLUENCE HYBRID SELECTION

There is a combined effect of planting yield trials at high populations, using NIRS and wet chemistry to measure starch quantity and digestibility, and using MILK2006 to predict feed quality. The result is that hybrids that thrive at high populations and have a kernel type that was bred for grain will appear to be the best feed. But how can this be? Grain-bred dual purpose hybrids have stiff stalks that were not bred for fiber digestibility. They produce small, tough, vitreous kernels that dry rapidly and were designed to resist fracturing - which is the opposite of what is needed in silage. They have a very narrow silage harvest window, which increases the risk of reduced feed quality. Good grain and good silage hybrids have opposing desirable characteristics, so the notion that a dual purpose hybrid can be best for both grain and silage is flawed.

Research and Development

BREEDING THE PARENT LINES

In our Glenn Seed breeding nursery, we hand-craft robust inbred parent lines that have been selected for silage-specific characteristics. This process of careful observation and pollination takes six to twelve generations. During these seasons our advancing inbred parents are exposed to a wide range of environmental pressures from insect damage and extreme weather events, to drought and diseases. Each event is an opportunity to advance only our best genetics and eliminate the rest. We select for disease and mold resistance, slow drying, low ear position on the plant and soft floury-type kernels on good, flexible stalks. We also select for seed production characteristics such as seed yield, and good pollen production. Once we have developed a robust parent line, we begin cross-pollinating it to other unrelated parent lines to produce experimental hybrids for yield testing.

Dr. Glenn and daughter Margo Lee working in our winter nursery in Chile. By having a summer nursery in Canada and a winter nursery in Chile, we can advance our germplasm by two breeding generations in one year.

HYBRID YIELD TRIAL TESTING

At Glenn Seed, we test hundreds of hybrid combinations every year. We assess replicated yield trials at multiple locations for several seasons before the very best hybrids are recommended for advancement to the marketplace. In order to test hybrids for silage performance, we use a John Deere HarvestLab that has been calibrated by Sapienza Analytica, in conjunction with visual observation.

Each hybrid that advances to the marketplace must excel in the following categories:

Dry Matter Yield (high)
Starch Content (high)
NDF Content (moderate)
NDF Digestibility (high)
Protein (moderate-high)
Moisture (maturity rating)
Stay Green (good)
Root Scoring (good)
Plant Height (moderate-high)
Ear Height (moderate-low)
Leaves above the ear (8-10)
Ear Rating (good)
Stalk Rating (good)
Kernel type (more floury)

Dr. Glenn and son Robert Glenn chopping and assessing silage plots. On average we test about 850 hybrids per year in roughly 6000 plots. Only about 10 new hybrids advance to the marketplace annually after they have completed three years of testing at multiple locations.

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LEAFY
CORN SILAGE

For over 25 years Leafy Corn Silage Hybrids have been bred and tested for the complex agronomic and nutritional requirements of the dairy. In this time, these hybrids have become a different type of corn plant. They offer a superior balance of effective and digestible fiber, more rumen-available starch, and boast dairy specific agronomics such as high total plant yields and long harvest windows. They need less time in the silo before they can be fed and produce high quality milk dependably and economically. Leafy Corn Silage Hybrids aim to deliver high yields of quality silage for making milk.

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