

GSL Silage Corn

SILAGE VARIETIES

Roundup Ready® Corn 2



GSL 86 RR

Floury Leafy

Superior Silage and Grain Nutritional Quality

CHU: 2475
RM: 86
COB: RED

Emergence: 8
Plant Height: 8
Silage Yield: 8
Starch Digestibility: 9
Fibre Digestibility: 8

GSL 92 RR

Floury Leafy

Outstanding Feed Quality and Plant Health

CHU: 2650
RM: 92
COB: WHITE

Emergence: 8
Plant Height: 8
Silage Yield: 9
Starch Digestibility: 9
Fibre Digestibility: 8

GSL 97 RR

Leafy

Adapts to All Soil Types

CHU: 2775
RM: 97
COB: PINK

Emergence: 9
Plant Height: 9
Silage Yield: 10
Starch Digestibility: 8
Fibre Digestibility: 8

GSL 98 RR

Floury Leafy

Showy Silage with Great Eye and Feed Appeal

CHU: 2800
RM: 98
COB: WHITE

Emergence: 8
Plant Height: 10
Silage Yield: 10
Starch Digestibility: 9
Fibre Digestibility: 8

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Modes of Action to Control Various Insect Pests

Insects SmartStax® RIB Complete®

• Black Cutworm ▲	• Corn Earworm ▲▲▲
• European Corn Borer ▲▲▲	• Northern Corn Rootworm ▲▲▲
• Fall Armyworm ▲▲▲	• Western Corn Rootworm ▲▲▲

• Required Structured Refuge: 5% (RIB)

To help preserve the benefits of our trait technology, an Insect Resistance Management (IRM) plan must be part of every farmer's production strategy. Farmers who purchase corn products that are not designated as RIB Complete® required to plant a refuge that is appropriate for that product. As part of the IRM plan for RIB Complete corn, experts recommend that growers incorporate crop rotations (out of corn), use of pyramided traits for below ground pests and, when appropriate, use of insecticides to minimize selection of resistant populations. **Farmers should monitor their RIB Complete corn fields for targeted insect pests and contact their local Monsanto representative, retailer, or Monsanto's Technical Support line at 1.800.667.4944 if they observe any unusual performance problems.**



Before opening a bag of seed, be sure to read, understand and accept the stewardship requirements, including applicable refuge requirements for insect resistance management, for the biotechnology traits expressed in the seed as set forth in the Monsanto Technology Stewardship Agreement that you sign. By opening and using a bag of seed, you are reaffirming your obligation to comply with the most recent stewardship requirements.

*Treats above and below ground insect pests

GSL LEAFY

Organic Varieties

GSL 86

Floury Leafy

**Superior Silage and Grain
Nutritional Quality**

**CHU: 2475
RM: 86
COB: RED**

Emergence: 9
Plant Height: 8
Silage Yield: 8
Starch Digestibility: 9
Fibre Digestibility: 8



GSL 94

Floury Leafy

Great Feed Value

**CHU: 2700
RM: 94
COB: WHITE**

Emergence: 8
Plant Height: 9
Silage Yield: 8
Starch Digestibility: 9
Fibre Digestibility: 8



Conventional Varieties

GSL 86

Floury Leafy

**Superior Silage and Grain
Nutritional Quality**

**CHU: 2475
RM: 86
COB: RED**

Emergence: 9
Plant Height: 8
Silage Yield: 8
Starch Digestibility: 9
Fibre Digestibility: 8

GSL 92

Full Floury

**Outstanding Feed Quality
and Plant Health**

**CHU: 2650
RM: 92
COB: WHITE**

Emergence: 8
Plant Height: 8
Silage Yield: 9
Starch Digestibility: 9
Fibre Digestibility: 8

GSL 98

Full Floury

**Showy Silage with Great
Eye and Feed Appeal**

**CHU: 2800
RM: 98
COB: WHITE**

Emergence: 8
Plant Height: 10
Silage Yield: 10
Starch Digestibility: 9
Fibre Digestibility: 8

Smart Stax® RIB Complete®

GSL 93 GSX

Leafy

**Solid Performer for Corn
on Corn Ground**

**CHU: 2675
RM: 93
COB: PINK**

Emergence: 9
Plant Height: 8
Silage Yield: 9
Starch Digestibility: 8
Fibre Digestibility: 8



GSL 102 GSX

Leafy

**Unmatched Agronomics
and Plant Health**

**CHU: 2900
RM: 102
COB: WHITE**

Emergence: 8
Plant Height: 8
Silage Yield: 9
Starch Digestibility: 9
Fibre Digestibility: 8



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 North American 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), the 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).

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

THE STARCH

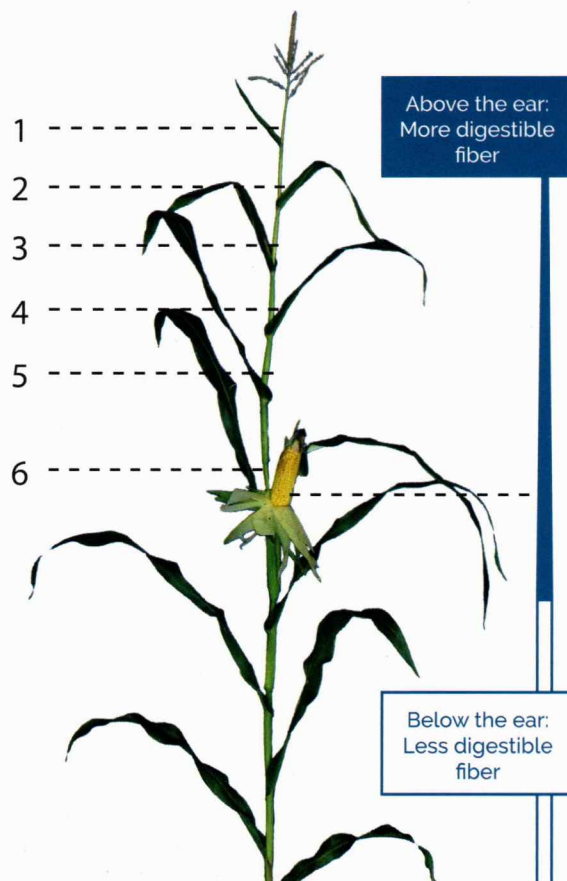
As a grain hybrid reaches silage maturity, its kernels dry rapidly and get very hard. This rapid drying creates a very narrow silage harvest window, which is further complicated by the extended stay green of the grain hybrid's stalk. Often, when the kernels reach a silage appropriate moisture, the plants are 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.

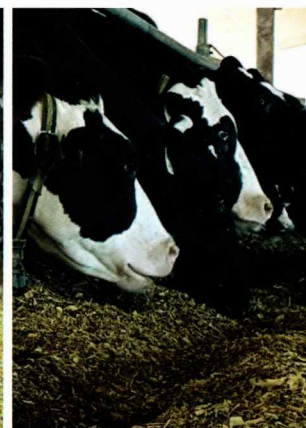
It can be difficult to harvest a grain hybrid for silage when its stalk is at the appropriate moisture level. It can pass from too wet to too dry rapidly and this reduces silage quality and feed efficiency. Excessively wet or dry silages often result in inadequate fermentation and unstable silage products.

IDEAL GRAIN



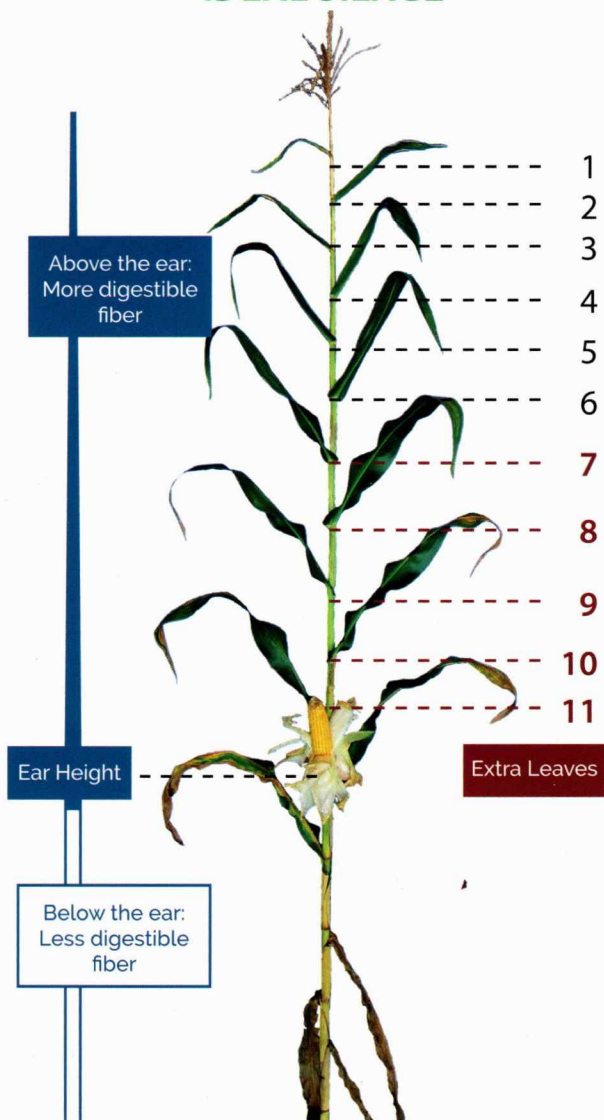
BREEDING FOR SILAGE

Roughly 8% of North American corn acres are grown for silage. Ideal corn silage 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. Then the corn is ensiled and 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 reliable high-yielding, fermentable crop that when fed to lactating cows promotes healthy and efficient rumination that is conducive to the production of a high quantity of high quality milk.



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

IDEAL SILAGE



Commercial grain hybrids cannot be the best silage hybrids since breeders select mostly opposing physical characteristics during breeding and testing.

	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.

EXPECT MORE FROM YOUR SILAGE CROP

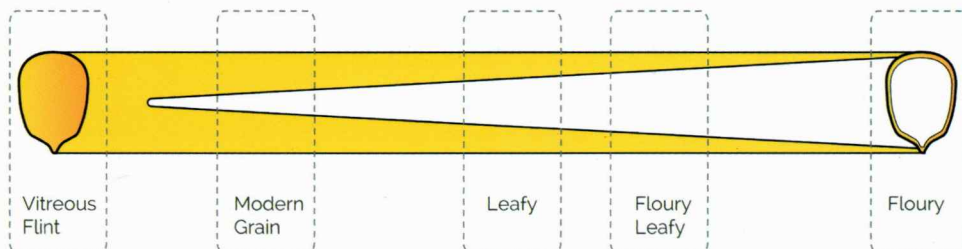
Why choose a few great silage characteristics when you can have them all?

Many corn silage hybrids 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.



Mature Floury Kernel, split in half

	Dual Purpose	Leafy	Floury Leafy	Full 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		●	● ●	● ● ●



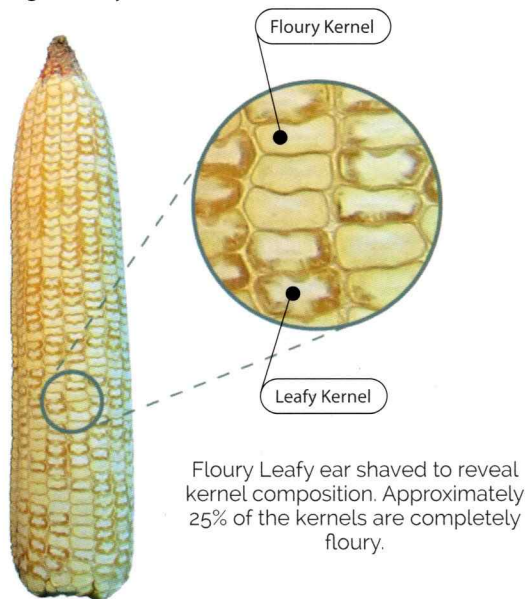
LEFT: Dual purpose hybrids have a modern grain type kernel with more vitreous starch, while Leafy and Floury Leafy Corn Silage Hybrids have more floury endosperm types.

For more information about Leafy Silage Corns go to: www.glennseed.com

FLOURY LEAFY CORN SILAGE

Featuring the same silage-specific characteristics as Leafy Corn Silage Hybrids, but with more rumen-available starch for milk production. Starch QUALITY is being recognized increasingly 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.



SMALL PARTICLE SIZE

Floury kernels fracture easily into small particles during silage chopping, allowing for a longer chop length (3/4" recommended) and a short minimum storage period of 30 days. 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.



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.



These silage-specific products have the opaque-1 gene in both parents of the cross. In each hybrid, one parent is a Flourey and the other is a Flourey Leafy line. In the farmer's field, these will produce ears with 100% floury kernels for a boost in starch digestibility.



These silage-specific products have all of the benefits of a Leafy with the addition of more digestible starch. They contain the recessive opaque-1 gene in one parent of the cross. When self-pollinated, 75% of their kernels are like those of Leafies and 25% are completely floury.



Named after the Leafy gene that produces a distinctive plant with 8 or more leaves above the ear, these silage-specific hybrids have been developed for dairy use. They produce big yields of digestible fiber and starch. Ears are composed of large, slow-drying dent style kernels.