2019 DEKALB® CORN SILAGE GUIDE

Presented by the DEKALB brand and Dairy Herd Management

PLAN TO PLANT:

Choosing the Right Corn Silage for Your Operation

Joe Lauer
University of Wisconsin

The corn silage hybrid you choose dictates your management style and the options available to you, according to Joe Lauer, Ph.D. and agronomy professor at the University of Wisconsin.

The right hybrid is a balance between two key factors:

1. **Silage Yield** — Consider foliage yield and grain yield; high-grain yield offers the flexibility to sell corn for grain as well as harvesting for silage.
2. **Quality** — Some hybrids, like BMR, are designed to offer quality corn silage. However, gains in quality are often sacrificed in grain yield.

"Bottom line, there's a lot of variation, so check out local plots or test hybrid performance in your own fields," says Lauer.

Plant Population

Corn for grain: 34,000 plants per acre

Corn for silage: 38,000 plants per acre

"Growers are planting corn for silage about 3,000 to 4,000 plants per acre higher plant density to achieve a higher yield," says Lauer. "You're giving up 2-4% in overall quality per ton, but it's possible to gain 5-10% yield."

Soil Type and Health

Plan your hybrid around soil type and health, and know the levels of your macronutrients, especially nitrogen.

Corn for grain: Potassium and phosphorus are often left in the field in remaining corn stover.

Corn for silage: Harvest removes significant nitrogen, potassium and phosphorus from the field, so more nutrients may need to be replaced.

Contract Silage Growers

Some dairies contract with grain producers to grow corn silage.

- There is no boiler plate contract; it's highly variable between the dairy producer and the corn silage grower.
- Both parties should be conscious of the contract specifics as it can influence each party's management decisions, such as hybrid choice, manure handling and quality adjustments.

KEY TRAITS FOR GRAIN VERSUS SILAGE HYBRIDS

Trait	Grain	Forage
Grain yield	High	Adequate
Forage yield	Adequate	High
Hybrid range	3.2 T DM/A	10,700 lbs. Milk/A
Stalks	Standability	Digestibility
Leaves	Unknown	Digestibility
Plant maturity	Full Season	5-10 Days Longer
Plant drydown	Stay Green	Synchronous
Kernel hardness	Hard	Soft

PLAN TO GROW:

Growing High-Quality Corn Silage

Joe Lawrence
Cornell University

Planning for your high-quality silage crop includes taking a close look at soil health and nitrogen management, according to Joe Lawrence, dairy forage systems specialist at Cornell University.

Nitrogen availability and mobility — Compacted soils affect the microbes that work to convert the nitrogen to the plant-available forms. It can also impact the potential for denitrification in water-logged soils. Having healthy soil with the proper ratio of pore spaces with air, as well as water that can drain properly when it rains, provides an environment for the microbes to convert the nitrogen and limit denitrification.

Organic matter and manure — These provide a slow release of nitrogen, like an IV drip. Instead of applying nitrogen that's available all at once in the form of fertilizer, organic matter and manure keep nitrogen in a stable form prior to conversion to a plant-available form by microbes. This allows for the release of nitrogen at different times throughout the season when plants can utilize it.

Fertilizer applications — The recommendation in the Northeast is to apply a small amount of nitrogen as a starter fertilizer at planting. Then, if needed, come back with a side-dress application. Applying all the nitrogen at planting is discouraged due to the potential for leaching losses. Nitrogen stabilizer products should also be considered to reduce losses to the environment.

Nitrogen deficiency — A crop that is nitrogen-deficient can reduce yield and quality. It can reduce protein content and may limit ear size, negatively affecting starch content.

Excess nitrogen — Nitrogen that's not taken up by the plant is susceptible to leaching losses during the fall and winter, offering motivation to be more precise with applications. Also consider planting cover crops as a way to protect soils and store excess nutrients over the winter. Excesses in the plant tend to delay maturity and harvest.

WHAT IS TAR SPOT?

- New corn fungal disease first identified in 2015
- Yield limiting in 2018 in the Midwest
- Survives in soil and on corn residue
- Carried by the wind
- Scout weekly

Photo courtesy of Martin Chilvers, Michigan State University

TOP DEKALB® CORN SILAGE PRODUCTS FOR 2020

	DEKALB Corn Silage Products	Value-Added Trait	Silage Yield @ 65% Moisture	NDFD30	% Starch	Milk per Ton	Milk per Acre	GDUs to Mid-Pollination	Emergence	Seedling Growth	Root Strength	Plant Height	Staygreen
	DKC39-07RIB BRAND BLEND	VT2PRIB	2	4	3	3	3	1200	2	1	4	T	4
	DKC45-07RIB BRAND BLEND	SSRIB	2	1	3	2	2	1195	3	3	3	M-T	2
	DKC48-56RIB BRAND BLEND	SSRIB	2	2	3	2	2	1200	2	3	3	M-T	2
	DKC53-45RIB BRAND BLEND	SSRIB	2	1	2	2	2	1265	3	3	3	M	4
	DKC54-38RIB BRAND BLEND	SSRIB	2	3	1	2	2	1300	1	2	2	M	3
(NEW)	**DKC55-37RIB BRAND BLEND**	SSRIB	2	1	2	1	2	1300	3	3	2	M-T	3
	DKC57-97RIB BRAND BLEND	SSRIB	2	3	2	3	2	1305	3	3	2	T	2
	DKC58-06RIB BRAND BLEND	SSRIB	3	3	3	3	3	1249	2	2	2	M	2
	DKC59-07RIB BRAND BLEND	SSRIB	2	1	2	2	1	1320	2	2	2	M-T	2
	DKC62-08RIB BRAND BLEND	SSRIB	3	3	3	3	3	1365	3	3	3	M	3
	DKC64-34RIB BRAND BLEND	SSRIB	2	2	2	2	2	1377	5	3	1	M-T	1
	DKC67-42RIB BRAND BLEND	SSRIB	2	3	3	3	2	1372	3	2	4	M-T	3
	DKC68-26RIB BRAND BLEND	VT2PRIB	1	3	2	2	1	1329	2	2	3	M-T	1
	DKC69-16RIB BRAND BLEND	SSRIB	3	3	3	2	3	1380	2	2	3	M-T	3
	DKC70-64RIB BRAND BLEND	SSRIB	1	3	3	3	2	1410	3	3	5	T	2

Rating scale: 1 = Excellent, 9 = Poor

Value Added Traits: VT2PRIB = VT Double PRO® RIB Complete® corn blend; SSRIB = SmartStax® RIB Complete® corn blend

PLAN TO HARVEST:

Tips for a Successful Harvest

Hugo Ramírez
Iowa State University

A successful harvest should start with a planning meeting with the teams involved in the process, including harvesting, hauling and ensiling. It's important to review the process, timing, who's leading in each area and contingency plans, says Hugo Ramírez, assistant professor at Iowa State University.

Monitoring Moisture

- Target 35% dry matter (DM) with a realistic range of 33% to 38%.
- Ensiling wet corn silage may result in poor fermentation and low energy.
- Cut some plants every two to three days for about a week to measure DM content. Drydown typically increases about 0.5 percentage units per day, but a heat wave could speed it up, so test fields regularly to hit optimal harvest.

Minimizing Shrink

- Use of an inoculant promotes effective fermentation, offering a 2% to 3% improvement in recovery of DM.
- The best opportunity for uniform inoculant application is at the chopper.
- Use non-chlorinated water or less than 1 ppm chlorine for the inoculant, and keep the water below 85°F; otherwise, the bacteria can weaken or die.
- Use oxygen barriers to maximize recovery of DM and reduce top-surface shrink by about 40% to 50%.

Chop Length

- Chopping to a very small particle size, like confetti, does not substitute for kernel processing.
- Chop length should be 19 mm (¾ inch).
- Set kernel processor at 2 mm to not only crack but fracture the kernel.
- Packing density should be at least 15 lbs. of DM per ft^3.

Safety First

- Shallow piles are safe piles. The drive-over pile should have a slope of 3:1.
- If packing in tall bunkers, use dual tractor tires to pack close to the wall edge but still maintain a safe driving distance.
- If collecting silage samples as forage is being delivered, stop all traffic until the person sampling gives the signal that he or she is clear of the area.

IS MY KERNEL PROCESSING SUFFICIENT?

Kernel processing is now standard practice when chopping corn because it damages the protective layer of corn kernels, providing better access to the starch for rumen bacteria. Properly processed corn silage should not have any visible whole corn kernels.

Separated kernels showing three levels of kernel processing. Only the material on the right could be considered adequately processed.

Photo courtesy of the University of Wisconsin Forage Team

PLAN FOR FEEDOUT:

Why Is Structural Fiber Important for the Rumen?

Peter Robinson
University of California-Davis

Structural fiber is made up of lignin, cellulose, hemicellulose and cutin, and it's referred to as "structural" because it's firm and visible, says Peter Robinson, Ph.D. and Extension specialist at the University of California-Davis. Structural fiber is involved in several important processes in the rumen.

Rumination or cud chewing — It is important in stabilizing the rumen environment and driven by dietary structural fiber. Cud chewing breaks open particles that have been eaten, but not significantly broken up, to facilitate bacterial attachment to particle surfaces. In addition, cud chewing stimulates salivation, which buffers the rumen to prevent its pH from dropping to cause rumen acidosis.

Nutrient provider — Fiber digestion leads to the creation of volatile fatty acids in the rumen which, once absorbed from the rumen, are a major energy source to support milk production.

Digestibility — Because of the physical nature of structural fiber, it takes up space in the rumen. One of two things can happen:

1. It's digested in the rumen — broken down into chemical compounds, such as volatile fatty acids, that are absorbed
2. It passes out of the rumen — broken down into smaller particles that pass on to the abomasum (true stomach)

Fiber that digests very slowly remains in the rumen and occupies space, which is limited in a rumen, so it results in reduced feed intake. Thus, the rate at which fiber is digested in the rumen is very important. For example, if fiber is 100% digested, but it takes 50 hours in the rumen to get there, then intake will be restricted by rumen space. A more valuable structural fiber is one that is only 50% digested but only needs 14 hours in the rumen to get there because this fiber stimulates cud chewing and salivation and is partly digested, but then passes out of the rumen to allow new fiber to enter in as new DM intake.

When fiber digests faster, it still expresses its structural characteristics, but the particles get smaller and pass out of the rumen and the animal can eat feed. Thus, more nutrients are available to the animal from absorption from the rumen.

WANT TO MAKE SILAGE MORE DIGESTIBLE?

- *Fermentation duration* — wait 90 to 120 days before pulling back the plastic
- *Fermentation efficiency* — uniformly apply an inoculant to create a more efficient fermentation process
- *Maturity at harvest* — adequate levels of 33-38% DM offer high starch digestibility, and it's very easy to break up/process the kernels