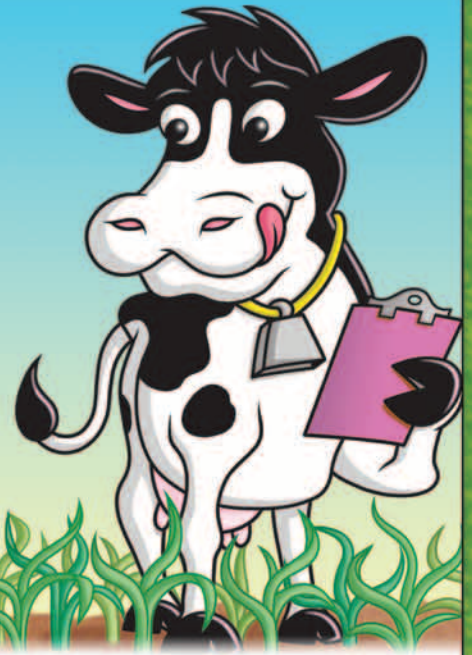


Silage quality starts in the field



Many factors during the growing season affect plant attributes. What can you do?

Every spring growers plant corn hybrids to cut for silage. Some years the quality is high, some years not so high. Here's a look at the factors that influence silage quality.

The first step is hybrid selection, notes Joe Lauer, agronomy professor at the University of Wisconsin. "Genetics selection is a critical quality decision," he says.

Start the season by selecting a short list of hybrids to help reduce the genetic variability of silage quality, suggests Bill Curran, Pioneer research scientist.

"Select a small group of hybrids with varying maturities," Curran says. "This ensures maturity and genetic diversity, while allowing growers to select key technologies, agronomic traits and disease strengths."

Don't delay planting

The next key is planting. Planting date and emergence uniformity influence silage quality as well as yield. The highest potential silage quality comes from planting as early as practical to establish a uniform plant stand.

"The planting date for silage should be the same as for grain corn," Lauer says. "For high yield, good quality and maximum milk per ton, plant early—within a week of grain corn."

"Ensure planters are tuned and set to field conditions," Curran says. "This will help ensure uniform seed distribution and plant establishment. Starter fertilizers can help plant development under challenging environmental conditions."

Curran also notes consistent plant spacing within the row helps ensure uniformity and maximize silage quality. Uneven emergence produces variability among plants, hence variability in silage quality.

"Plants may develop differing heights, differing levels of grain set and, consequently, a range in silage dry matter at harvest," Curran says. "All these can have detrimental effects on silage quality traits."

Mother Nature weighs in

Of course, weather is the wild card. Planting hybrids of different maturities can help offset the potential effects of weather.

"A longer-season hybrid generally will develop more plant mass than a shorter-season hybrid," Lauer says. "It may have 21 to 23 leaves, compared to 15 to 17 leaves."

Depending on weather, maturity can make a big difference in grain quality. Lauer notes in 2005, drought stress in Wisconsin was alleviated by rain during the third week of July. "This rain came in time for both early- and late-maturity hybrids to deliver good yields," he says.

However, in 2006, a period of drought stress went unrelieved until several days into August. "For early-season hybrids, the rain came too late," Lauer notes. "Late-season hybrids still posted good yields."

Timing keys drought stress

If drought is persistent, it will threaten hybrids of all maturities.

“Moisture stress can change the development of a plant, depending on its timing and severity,” Curran says. “Moisture stress at flowering can have a dramatic affect on yield, plant size, grain set and the grain-to-stover ratio.” Drought during the later stages of grain fill has less influence on starch content and, thus, silage quality.

Lauer again cites 2005 and 2006 in Wisconsin. In the earlier year, drought stress was substantial during vegetative stages, leading to shorter plants. However, rains fell at pollination, leading to good grain fill. “We had a silage that was hot, or higher in starch,” Lauer reports.

In 2006, however, plants generally grew taller but saw less grain fill. This raised fiber content at the expense of starch. The higher fiber content on a dry-matter basis could result in reduced digestibility.

“In 2006, a grower could have raised the cutter bar to bring the fiber:starch ratio into alignment,” Lauer says. “You’d leave the poorest-quality part of the plant in the field.”

Curran notes insects can have a detrimental effect on plant health and starch deposition, too. For maximum silage quality, Pioneer suggests using corn borer protection in areas where corn borer pressure might curtail grain production.

Weed pressure also can limit both yield and silage quality.


“Like other biotic factors that limit the production of yield, molds and mycotoxins can have a deleterious effect on silage quality,” Curran says. “Plant pathogens that influence plant development, starch production and late-season plant health can reduce silage quality.”

Harvest timing is vital

Harvest timing can have a dramatic effect on silage quality. Harvesting too early may lower starch deposition, changing the grain-to-stover ration. Harvesting too late can result in high levels of lignin, which may reduce feed intake.

“Pioneer conducts harvest timing studies to define quality changes throughout the harvest window,” Curran reports. “We find dry-matter content can increase by 3 to 5 percentage points per week. Take this into account during harvest.”


Lauer says it’s good to know the planting date, maturation date and tasseling date of hybrids grown for silage. If you know the tasseling date — or better yet, the silking date — you can add a standard number of days to get a good harvest target date.

However, Lauer also suggests constantly evaluating drydown to pinpoint harvest data. With customer choppers, you may not be able to name your date, but you can prioritize fields based on drydown progress. 



Key items to consider

Here are several key items corn silage growers may want to consider to help ensure quality production.

1. Select a group of hybrids to offer the best opportunity to reduce risk and capture quality.
2. Ensure optimum planting date for best stand establishment.
3. Use agronomic practices providing the best opportunities for stand establishment.
4. Use a planting rate that represents the goals of the silage program: Higher plant densities will increase yield but may decrease quality.
5. Harvest timing is critical. It can make or break all other management strategies.
6. Use best management practices after harvest, including storage and feedout management. 

Maturity differences

In each geography, growers tend to plant silage hybrids with later maturities than those they grow for grain. This can shorten the grain-fill period, which leads to reduced silage quality compared to the fuller-season hybrids.

For example, suppose the adapted zone is a 103 CRM (comparative relative maturity), and two hybrids with CRMs of 113 and 103 are planted. The 103 will tend to have a higher starch content, better fiber digestibility and whole-plant digestibility relative to the 113 maturity hybrid. Delayed planting dates or uneven emergence can compound the inherent differences among different CRMs grown in the same geography.

Growers may want to plant several maturities to spread risk. Joe Lauer of the University of Wisconsin suggests a ratio of maturities based on your risk comfort level. You might plant 50 percent longer-season hybrids, aiming for the highest possible yields, with 25 percent mid-maturities and 25 percent early-season hybrids.

If you want to play it safer, perhaps you could plant 25 percent longer-season, 50 percent mid-level and 25 percent shorter-season hybrids. 