by John Goeser

Factors like growing conditions, soil fertility, and kernel processing seem to have fueled a higher feeding value for 2024 corn silage.

What fuels feed value?

WHEN hopping into my light duty diesel truck and heading to a meeting, I'm cognizant of the distance to empty. I tend to run hard, as many do in agriculture, leaving only a few minutes to spare in between meetings. Thus, needing 10 to 15 minutes to fuel up is not ideal, so the distance to empty (DTE) estimate is always up on my truck's dashboard.

The DTE is determined by the amount of fuel on board and the current fuel conversion efficiency, measured in miles per gallon. The fuel conversion efficiency is akin to feed conversion efficiency in that it is affected by various factors and current conditions. For example, when driving into a strong headwind, the miles covered per gallon of fuel is dramatically reduced. Similarly, forage quality needs are greater when feeding cattle in freezing conditions.

This is the point to latch onto in this month's column — not necessarily the energy consumed in different conditions, but an interaction between conditions and feed quality. There are many interactions between forage and grain to account for that affect feed energy value, ration performance, and feed conversion efficiency.

With dairy or beef nutrition, these interacting factors can be categorized into several areas. To break them down, consider fiber and grain particle size, nutrient content, nutrient digestibility, and feed hygienic characteristics as separate categories that interact with one another in the ration. Each of these interacting factors can be affected by seed genetics, agronomic practices, harvest management, and growing conditions. The first three of the four are under your control, and we're going to talk more about the harvest management factor here.

In a *Hoard's Dairyman Intel* article titled "Grain hardness likely affects kernel processing," we uncovered an upward trend in both new crop silage starch digestibility (Figure 1) and kernel processing scores (Figure 2). This side by side upward trend in corn silage starch digestibility and processing is notable because I think they're tied together.

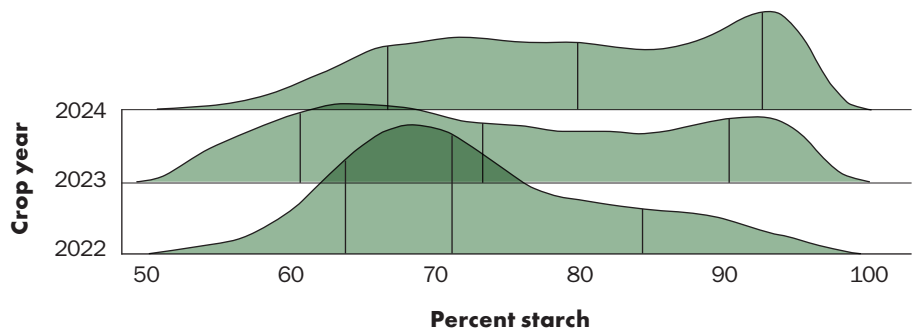
In the article, I referenced a custom harvesting operator who asked me about relationships between corn hybrid and processing several years ago. His experience suggests a strong relationship between seed genetics and harvester processing performance, not to mention diesel usage in his high-powered machine. Building upon this experience, I'm speculating the 2024 growing season likely impacted plant nitrogen use, grain development, and subsequent starch digestibility and kernel or grain processing potential.

Nitrogen dynamics

To build the case around these interacting factors and outcomes, we should understand plant development. We've learned over the past decade that a protein cage in the grain endosperm surrounds the starch granules. This protein cage is called prolamin, and it's important for grain test weight and density. Pat Hoffman taught me that more nitrogen fertilization and protein equated to harder and denser grain.

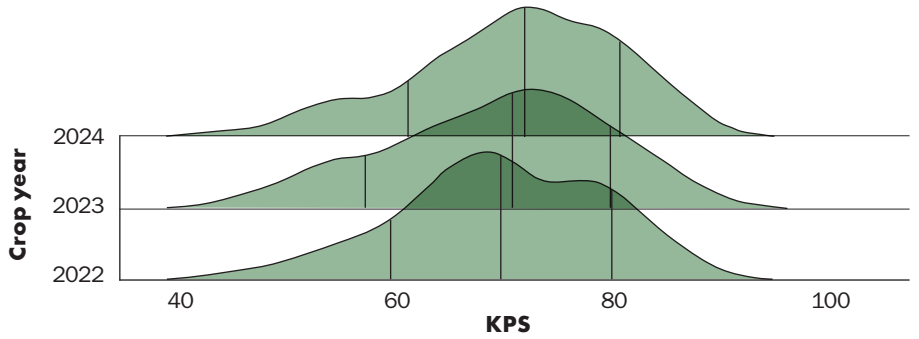
We also know that soil-applied nitrogen is mobile with water, and

Figure 1. Midwest corn silage rumen in situ 7-hour starch digestibility



Vertical lines represent the 15th, 50th, and 85th percentiles.

Figure 2. Midwest corn silage kernel processing scores (KPS)



Vertical lines represent the 15th, 50th, and 85th percentiles.

in some regions, this past growing season offered plenty of rainfall to move nitrogen a bit deeper in the soil. At the same time, the excessive rainfall earlier in the year for many also equated to shallower roots in corn. I believe the outcome was less plant-available nitrogen earlier in the year and fewer plant resources to yield a strong kernel as grain development proceeded during drier conditions.

Think of this like how a floury mutation in corn equates to a softer and more rumen digestible grain. If the grain was indeed softer, then it also stands to reason that softer grain might process differently, such as what we're seeing play out in the Rock River Laboratory kernel processing score database.

Tying this all back together relative to the introduction of this column, think about your farm's interacting conditions last year — growing conditions, fertility plan and management, and kernel processing — like available diesel fuel and fuel conversion efficiency. Then, consider how soil fertility, growing conditions, and harvest practices can ultimately affect silage feeding value.

The 2024 silage grain feeding value looks to be up, which will help offset lower quality fiber in silage that we've previously observed and discussed. Take up these talking points with your agronomist and nutritionist as you evaluate and feed out last year's corn silage. ●

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