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Production Blog

Corn Black Layer Sends a Signal About Building Dry Matter

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By Pamela Smith, Crops Technology Editor

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Are you seeing a dab of darkness at the end of the kernel? That's black layer, and it means the corn plant is done moving sucrose into the kernel. (DTN photo by Pamela Smith)

There's a race going on in your corn field, and every kernel will cross the finish line.

It's called black layer. Break an ear open and examine a kernel tip where it attaches to the cob. If a thin black line exists at that tip, grain fill is complete.

Black layer is something farmers talk about often, but a review of the literature and discussions with agronomists uncover that there are bushels of science in this tiny black spot.

"The black layer forms as cells at the tip are crushed and die," said Matt Montgomery, Beck's agronomy education lead. "The door is shut on the flow of sucrose into the kernels. There's no other highway to get more nutrients into that kernel."

Typically, this "game over" signal happens when the corn plant has reached physiological maturity. But sometimes, a stress such as hail, disease or severe drought triggers an early onset of black layer.

Reports of every one of those stressors have emerged in August and early September this year, depending on the region.

Bob Nielsen, Purdue professor emeritus of agronomy, addresses common misconceptions about black layer in an Aug. 15, 2025, Pest & Crop Newsletter.

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The thought that kernel black layer formation sometimes fails to occur following a frost or other late-season severe stress is not true, Nielsen wrote.

"The kernel black layer always develops. Any severe stress that occurs during the grain fill period will cause premature kernel black layer formation and is related to the reduction in or termination of sucrose (photosynthate) availability to the developing kernels (Afuakwa et al., 1984)."

Nielsen provides more details on what happens in cases of severe stress during grain fill here: <https://extension.entm.purdue.edu/...>

DRY DOWN COUNT DOWN

In the Midwest, the rule of thumb is that corn dries at a rate of 0.5% to 1% per day in September. That declines to 0.25% to 0.5% per day in October. November rarely offers much in the way of good drying conditions.

In general, corn grain moisture at black layer will range from 30% to 35%, but it can vary depending on the hybrid and environmental conditions, Montgomery said.

Also, he said it is important to keep in mind that the entire field doesn't necessarily black layer at the same time. Ears also black layer from tip to butt end -- another thing to watch as you are assessing fields.

"After black layer, moisture loss occurs through evaporation of water from the kernel surface," he added.

Sotirios Archontoulis, Iowa State University professor of integrated cropping systems, posted results from a 2025 relative maturity study here:

<https://crops.extension.iastate.edu/...> He also points to a tool to predict corn dry down in the field using algorithms developed for the northern Corn Belt. Find it here: <https://facts.extension.iastate.edu/...>

While we refer to black layer often, it hasn't always been widely understood what it was or why it exists. Paul R. Carter, Pioneer senior agronomy sciences manager, offers the backstory and many details about the science here: <https://www.pioneer.com/...>

CROSS THE LINE

This crop season has thrown a lot of curveballs. "When diseases or other stresses cause that plant to hit black layer early, it's like the plant doesn't have anything left to give. Stalks become weak and often degrade more quickly," Montgomery said.

"This year, there are a lot of reasons to go out and assess what you've got that might present harvest challenges and stage harvest from there," he added.

Find Matt Montgomery's Crop Updates on YouTube and more agronomy information from Beck's at <https://www.beckshybrids.com/...> For alerts about postings, follow Montgomery's social media account on X @matt_montgo

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