Agronomy Newsletter

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Topics:

- **Looking Back on 100 Years of Pioneer**
- **High Temperature and Water Stress in Corn**
- **The Future of Plant Breeding: Genome Editing**
- **Corteva Tru-Choice Chemical Prepay**

100 Years of Pioneer

Pioneer Long Look

First: We try to produce the best seed corn and baby chicks on the market.

Second: We try to deal honestly and fairly with our employees, salesmen, business associates, customers and stockholders.

Third: We try to advertise and sell our products vigorously, but without misrepresentation.

Fourth: We try to give helpful management suggestions to our customers to assist them in making the greatest possible profit from their corn fields and laying houses.

Pioneer celebrates its 100th anniversary in 2026, this milestone offers a moment to reflect on a century of innovation, leadership, and impact in the seed industry. Founded by Henry A. Wallace in 1926, Pioneer began as a bold experiment in corn breeding and quickly grew into a driving force for agricultural progress. Wallace's vision and scientific curiosity laid the foundation for a company that would revolutionize crop genetics, empower farmers, and set enduring standards for quality and agronomic support. From the beginning, Pioneer strived to do what is best for the farmer. That is reflected in the Long Look, pictured above, the guiding principles by which Pioneer operated their business. Originally written in 1952, the Long Look is still vital to how Pioneer, and Dane and I, do business today.

(Many will not remember that Pioneer was once in the chicken breeding business as seen in the first line.)

High Temperature and Water Stress in Corn

High temperatures significantly increase water stress in corn, primarily by raising the plant's demand for water rather than only through direct heat damage. As temperatures rise, the atmosphere's evaporative demand increases, causing corn plants to lose water more rapidly through transpiration. Research shows that increasing temperatures from about 80°F to 95°F can double water demand, accelerating the onset of drought stress even when soil moisture is adequate.

This process is driven by vapor pressure deficit (VPD), a measure that combines temperature and relative humidity to describe how strongly the air pulls moisture from plant leaves. Because the interior of plant tissue is nearly 100% humid, higher temperatures sharply increase the difference between internal leaf moisture and surrounding air. As VPD rises, water is drawn out of leaves faster, placing greater strain on the plant's water supply and increasing stress during hot conditions.

Corn plants respond to high VPD by closing their stomata to conserve water. While this response helps limit water loss, it also restricts carbon dioxide intake, reducing photosynthesis and slowing growth. Field studies show that on hot, high-VPD days, photosynthesis peaks in late morning and declines sharply through the afternoon, (pictured to the right), even in irrigated fields. The decline is much more severe under non-irrigated conditions, demonstrating how heat and water stress interact to reduce productivity

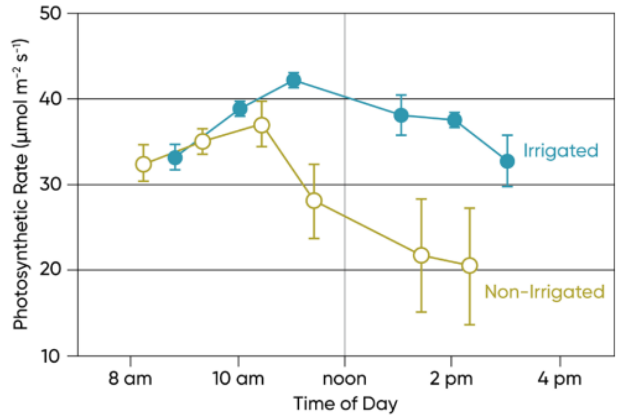
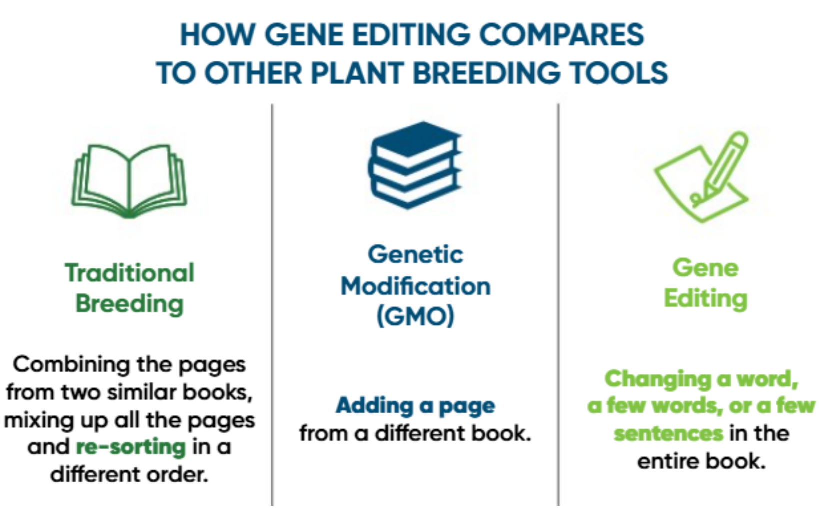


Figure 5. Leaf photosynthetic rate by time of day for irrigated and non-irrigated corn (Hirasawa and Hsiao, 1999).

The takeaway here is that water demand can be just as important as water supply in determining corn stress and yield. Some studies indicate that increases in temperature can have a greater negative impact on water stress than moderate reductions in rainfall, helping explain why extreme heat years may be worse than low rainfall years. Vapor pressure deficit is therefore a more accurate indicator than relative humidity alone for understanding crop stress under rising temperatures

The Future of Corn Breeding: Genome Editing



Genome editing is a modern plant breeding tool that allows scientists to make precise, intentional changes to an organism's own DNA by adding, removing, or altering specific genes, without introducing genetic material from another species. Unlike GMOs, where genetic material is introduced from a separate species, these edits mimic naturally occurring genetic variation. They produce results that are indistinguishable from those achieved through traditional breeding, but far more efficiently. Often compared to editing a document with a word processor, genome editing enables targeted adjustments to a plant's existing genetic "text" to improve specific traits. This technology allows breeders to rapidly develop improved crop varieties, such as transferring disease-resistance traits into high-yielding elite lines, in a single generation. This allows them to avoid the lengthy, costly, and less precise backcrossing required by conventional breeding methods.

One exciting application is the development of what Pioneer is calling Multi-Disease Resistant corn. Corn genetics worldwide contain many naturally occurring disease-resistance genes, but these traits are often found in lower-yielding or poorly adapted varieties and are located far apart on different chromosomes. Conventional breeding to combine these genes into elite hybrids is slow, costly, and can introduce undesirable traits through genetic linkage drag. Using CRISPR genome editing, Corteva can efficiently combine and reposition native disease-resistance genes and introduce them into modern, high-yielding corn varieties while preserving their elite genetic background.

Corteva's first Multi-Disease Resistant corn product is designed to protect against gray leaf spot, northern corn leaf blight, southern corn rust, and anthracnose stalk rot. This genome editing strategy is highly adaptable, allowing the same approach to be applied to additional diseases, other crops, and diverse growing regions worldwide, expanding the potential impact of genome editing across global agriculture.

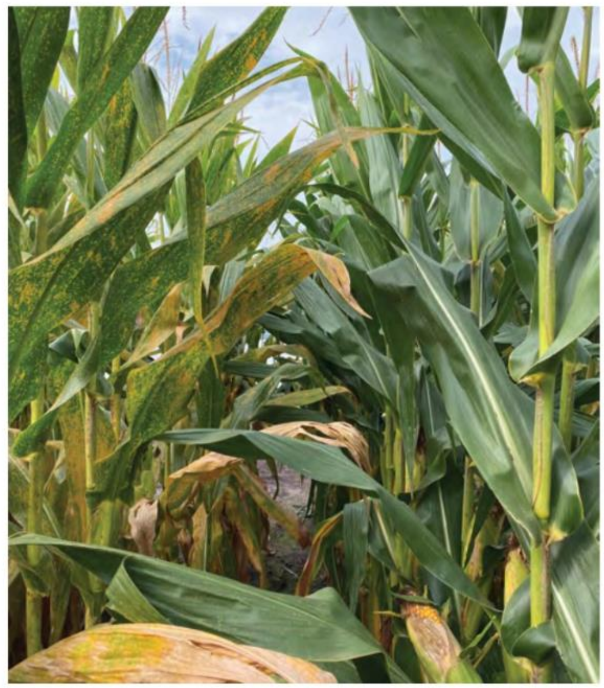


Figure 1. A gene-edited corn hybrid with multi-disease resistance (right) next to a conventional isoline hybrid (left) showing contrasting severity of southern rust (*Puccinia polysora*) infection. (Johnston, Iowa; September 3, 2025.)

The speed at which genome editing will be used for commercial breeding is yet to be determined. As with many new technologies, the regulatory framework must be worked out as the technology develops. Adoption of genome editing on a large scale will require that regulatory agencies view it as a natural breeding process, and that the resulting hybrids and varieties are not considered as "GMO". While it is still undetermined how rapidly this technology will be adopted, it is sure to bring some major advances to crop performance in the near future.

Tru-Choice Chemical Prepay:

This is a reminder that the **Corteva Tru-Choice Prepay deadline is Friday February 27th.** By prepaying for Corteva chemistry (Enlist, Approach Prima, N-Serve, Resicore, etc.) you receive an additional 5-15% added buying power as a Pioneer customer. Cash prepay is 15% and financed prepay is interest free + 5% added buying power. **A cash customer who deposits $10,000 would have $11,764 to spend on Corteva Chemistry.**