



Heat Stress

Overview

It's a common perception that high heat and humidity are ideal for growing corn. In reality, high temperatures are not always beneficial, especially during the critical grain fill period. High nighttime temperatures are particularly troublesome, because that's when a corn plant uses more manufactured sugars for cell maintenance and less for dry matter deposition. High temperatures could lead to lower yields and test weights.

What you should know

- Biological systems are driven by temperature and environment. As temperatures increase, biological processes speed up. Conversely, a cold environment causes systems to slow down. Excess heat can cause concern in key growth stages.
- Photosynthesis is the temperature-sensitive process by which carbon dioxide and water combine in the presence of sunlight to produce sugar. The sugars are used for cell growth and dark respiration. Dark respiration consumes sugars to perform cell growth through division and maintenance.
- Temperatures above 86°F during the day reduce the amount of sugar produced. Likewise, nighttime temperatures warmer than 70°F require higher rates of dark respiration. More sugars are consumed in this dark reaction, leaving less available for cell growth. This results in less available sugar for building complex molecules such as starches, which are ultimately stored in the grain.

Action steps

1. **Maintain moisture:** Monitor soil moisture during high-temperature waves and irrigate when necessary to maintain adequate moisture.
2. **Monitor humidity:** High humidity reduces a plant's ability to cool itself, resulting in decreased photosynthesis. Leaf diseases also are more likely to spread in high-humidity situations, reducing the leaf area available for photosynthesis. Humidity also increases corn plants' susceptibility to stalk rot.



High temperatures reduce yield by causing corn plants to use sugars for cell maintenance instead of grain production.



30-Second Summary

- High temperatures, especially high nighttime temperatures, can reduce corn yield potential by increasing respiration.
- Monitor soil moisture during heat waves and irrigate if necessary, while trying to avoid creating a damaging high-humidity situation.

NOTES:

For more information, contact:



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1-888-647-3478