

Hardin County Extension News Release

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Corn and Soybean Heat Stress

Hardin County – The 2022 crop has already seen its fair share of stress. But with the forecast of a flash drought and much higher than normal June temperatures, we will be seeing some extra stress that we may normally anticipate for later in the growing season. Nevertheless, our crops are very resilient.

The original corn plant was a tropical grass that can tolerate temperatures up to 112°F for a short amount of time, but optimal daytime growth ranges from 77°F to 91°F, though 86°F is what is used for growing degree days because that is the average temperature where a corn plant will start to experience water stress. Corn growth starts a rapid decline when temperatures exceed 95 degrees.

Temperatures exceeding 86°F can be calculated as stress degree days, which is a way of tracking how much stress a type of plant has been subjected to. According to agronomists with Iowa State, in years when corn exceeds 140 stress degree days, achieving above-average yield is difficult.

However, according to agronomists at the University of Illinois afternoon temperatures in the mid-90s are not usually a problem for corn when there is enough soil water available.

Temperatures above 100°F can begin to damage leaves. Though it is important to remember adequate water can increase the ability of the plant to handle heat stress. The combination of dry and hot is more damaging.

Leaf rolling is a common symptom of high-temperature stress. Yield diminishes by 1% for every 12 hours of leaf rolling during vegetative growth but increases to 1% every four (4) hours during silking. When water is deficient during a heat wave the loss of yield increases after four consecutive days of 93°F or above, not including the stress from leaf rolling. So, the impact of heat stress can be two-fold.

Soybeans have a similar range in temperature to corn for heat stress. Temperatures above 85°F for several consecutive days can cause heat stress. This heat can accelerate maturity because soybeans are photoperiod and temperature-controlled when it comes to flowering. During vegetative stages, these high temperatures can slow or stop photosynthesis because the plant is making an effort to conserve water. Thus, inhibiting new vegetative growth, which is vital for late-planted soybeans. Temperatures above 86°F can also reduce nodulation and therefore N-fixation in the soybean which could have an effect until the reproductive stages.

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