

David G. Hallauer
District Extension Agent
Crops & Soils/Horticulture

Cold Injury to Corn

The 10:00 A.M. two-inch soil temperature at the Corning Kansas Mesonet Station on March fifth was 50 degrees – warm enough to plant corn, right? Twenty-four hours later – it was 39 degrees. April will be more stable, at least to a degree, but even it will have its swings, and those swings can often cause concern for corn growers.

Cold injury to corn can come in multiple forms. If temperatures are hanging around the 50-degree mark for multiple days after planting, germination will be delayed and emergence of young seedlings slowed. If there was the potential for plenty of plants out there to begin with (high populations) and emergence is still fairly uniform (by date and within the row), we'll likely go on like nothing ever happened. If not, losses due to uneven stands may occur.

Another form of injury is what's known as imbibitional chilling. This occurs during the seed's initial uptake of water (first 24-48 hours) after planting. Moist soils cause the seed to rehydrate and germination to begin. As rehydration occurs, internal cell membrane structure is damaged. If the seed/soils are warm, the membrane damage is quickly repaired by natural seed process and nothing is ever noticed. Cold seed, however, has less elastic membranes. Reduced elasticity equals increased membrane injury. In combination with slowed – or even stopped – damage repair mechanisms, cell contents begin to leak and death of the seed can occur.

Predicting damage is inexact at best. Most literature would suggest soil temperatures below 50 degrees F are the key. A second factor is the timing of the cold soils in relation to the water uptake phase, with injury likely to occur during the first 24 to 48 hours, even though we're not sure whether it only takes a few hours of exposure to critical temperatures or if lengthier exposure windows are required.

With any luck, temperatures will increase and continue to gradually do so, allowing even the earliest planted corn to pop out of the ground without injury. If we get a mid-April like last year, however, consider the possibility for chilling injury and plan accordingly. One resource to bookmark for future reference is the Kansas Mesonet soil temperature page: <https://mesonet.k-state.edu/agriculture/soiltemp/>. Current as well as historical soil temperature data can help you see whether an upward trend is conducive to planting - or if a little wait is in order.

Bolting and Buttoning in Cole Crops

One of the complaints growers of broccoli, cabbage and cauliflower sometimes express is the lack of good production – or production at all. If not grown properly, these cole crops certainly express a tendency to bolt (go to seed) or button (produce an extremely small head).

The tendency for them to do so comes in many cases because they don't maintain active growth through the production cycle (including transplants from seed). Any slowing of growth (under-fertilization, outgrowing a container, etc..) can result in issues with careful consideration necessary to address needs of plants grown for transplanting *before* there's an issue.

When *selecting* plants for transplanting, choose small, stocky, dark green plants. Apply fertilizer at transplanting with a starter solution and continue to apply every two to three weeks until harvest.

Both buttoning and bolting are irreversible. Once a seed stalk starts for form, nothing can be done to force the plant to produce a normal crop.