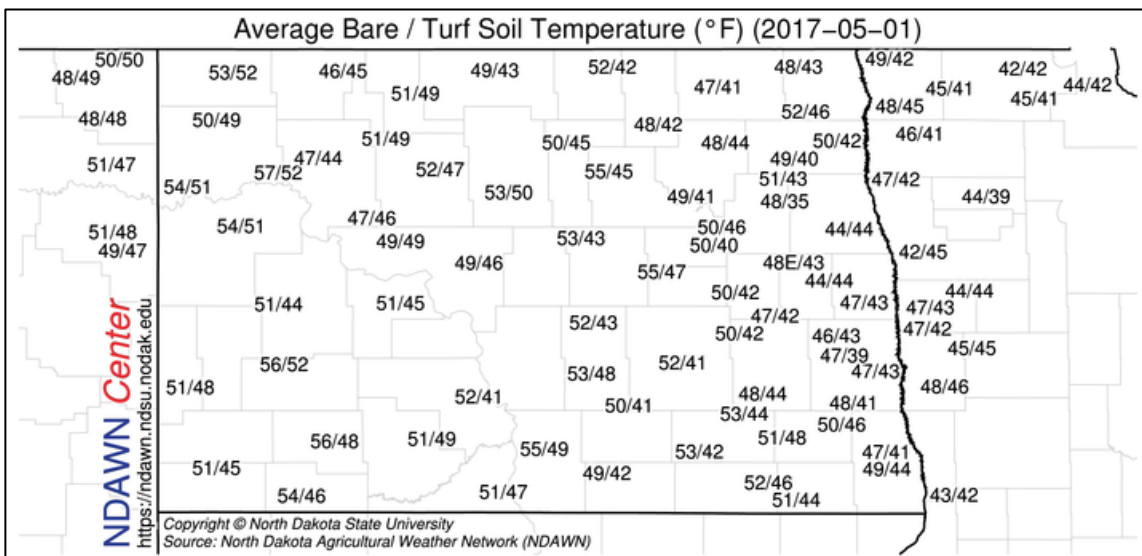


Imbibitional Chilling in Corn

Soil temperatures and forecast for the week

With the recent cool, wet weather soil temperatures have certainly dropped across Minnesota (MN) and North Dakota (ND). As of May 1st most are in the low-mid 40 degree range. If we can get a nice run of sunshine and warmer weather, soil temperatures will increase rapidly. The North Dakota Ag Weather Network provides a good website for monitoring soil temperatures in ND and Northwest MN (<https://ndawn.ndsu.nodak.edu/soil-temps.html>). In addition the MN Department of Agriculture offers a real-time, interactive map for soil temperatures across the state (<https://app.qisdata.mn.gov/mda-soiltemp/>).



Imbibitional Chilling - cooler temperatures and cold rain following planting

Now that we are in early May the calendar, not soil temperatures, will predict when corn gets planted. That said, because of cold soil temperatures and saturated conditions it's important that growers are educated on the effects these conditions can have on germination and plant stands. Corn seed is very dry and has a high affinity for water immediately following planting. Within the first 24-36 hours of planting, the seed will absorb 30% of its weight in water to initiate the germination process. In the germination process, cells begin to divide and

elongate; if these cell tissues are too cold they can become less elastic and may rupture during this process. In many cases this leads to poorer germination, variable emergence and reduced plant populations. There is not definitive evidence for exactly how low soils temperatures need to be for imbibitional chilling injury to occur but sources all agree that soil temperatures less than 50F and certainly in the low 40'sF run high risk for injury.

It is important to scout fields that have already been planted as that germination process has likely started. As these plants start to elongate and move towards the soil surface, they can be sensitive to cooler temperatures. Wide fluctuations in soil temperatures can cause the mesocotyl to "corkscrew" and ultimately delay emergence and potentially reduce plant populations depending on temperatures and severity. For information on properly assessing plant stands for replant consult the KnowMore, GrowMore article titled "2017 Corn Replant Decisions."



Credit: Roger Elmore, Integrated Crop Management News, Iowa State University Extension and Outreach; <http://crops.extension.iastate.edu/cropnews/2012/05/imbibitional-chilling-and-variable-emergence>

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