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### Why 50 Degrees?

There are lots of ‘rules’ we operate by during the corn growing season. Soil temperatures should be 50 degrees (and climbing) when we plant. Optimum fungicide application window is between tassel and early reproductive stages, and this time of year, fall anhydrous applications should be delayed until soil temperatures cool below 50 degrees. They’re all good ‘rules’ and all have reasoning behind them, but have you ever wondered what that reason is?

Take the soil temperature recommendation for fall anhydrous applications. There’s nothing necessarily *magical* about 50 degrees (at a four-inch depth). The conversion process of nitrogen from a form with less possibility of being lost through the winter to one with a greater possibility doesn’t cease at 50 degrees (it *does* slow significantly at 40 degrees) – it just slows. In fact, any time soil temperatures are above freezing, conversion can occur (if wheat is growing, conversion is occurring), with nitrogen transitioning to a state more susceptible to loss.

Why then do we shoot for 50 degrees? One reason is the ability to spread out our application workload by applying a fertilizer product with a reduced loss potential under appropriate temperature and moisture conditions. If our typical fall weather pattern results in decent moisture plus consistent cooling of soil temperatures to 50 degrees with a continued downward trend through the fall, N conversion to a more loss prone state will be held to a minimum, reducing the potential for losses through the winter. To monitor soil temperatures in-field, use a soil thermometer to check temperatures at a four-inch depth in mid-late morning. For continuously measured soil temperatures (including temperature trends), check out the Kansas Mesonet Soil Temperature page at <https://mesonet.k-state.edu/agriculture/soiltemp/>.

If Mother Nature doesn’t cooperate and soil temperatures remain elevated (or increase) following application, loss potential increases as well. When this occurs, more and more ‘stable’ N is converted to a form of nitrogen at greater risk for loss, potentially leading to economic and environmental concerns.

If you’re making a decision on whether to apply or wait, there are a number of great agronomic explanations – and recommendations - to help you minimize nitrogen losses. One of the best is from KSU Nutrient Management Specialist Dr. Dorivar Ruiz-Diaz in the October 26<sup>th</sup> edition of the KSU Agronomy eUpdate online at: <https://eupdate.agronomy.ksu.edu/> or upon request at any District Office. Drop me a line if you are interested.