Focus on In-Season Nitrogen Management

With the majority of Michigan’s corn crop in the ground, attention turns to in-season management, including optimizing crop fertility. Many areas of the state have enjoyed favorable early season conditions, while some areas have experienced heavy rains that may impact N supply and availability in the soil. Regardless of the early season conditions, attention to N management is important with crop yield potential, weather, and N application strategies all influencing in-season management.

Pre-plant N applied to fields that have seen heavy rainfall over the last few weeks are of the most immediate concern when evaluating in-season N management needs. Leaching and denitrification losses are both concerns in these situations and can result in the loss of pre-plant applied N and insufficient supplies for the remainder of the season. The initial forms of N fertilizer applied have a bearing on the speed and extent of N losses. Urea forms will convert to ammonia, followed by ammonium in the soil. This ammonium form, which is also found in anhydrous ammonia or urea ammonium nitrate solution (UAN), isn’t particularly susceptible to losses. Nitrification processes will quickly convert ammonium to nitrate in just a few weeks when soil temperatures are above 55F. This nitrate is then susceptible to multiple loss pathways. Nitrogen that has been applied to fields in nitrate forms are at greater risk for loss this spring than N from other sources.

In many cases, the bulk of N needs are supplied through sidedress applications once the crop is emerged and growing. In these cases, assessing the yield potential of the field is important to optimize nutrient management. Time-testing tools such as pre-sidedress N soil tests and plant tissue tests remain valuable assessment options. New technologies, such as on-the-go remote sensors and computer models, provide additional capabilities as well.

Variability in fields is also a point of consideration this year and can be addressed through these in-season sidedress applications. Ponding from heavy rains has necessitated replanting in many areas, and those same standing water issues will impact N availability. Variable rate N application equipment can effectively account for this in-field variability, lowering N costs and optimizing crop nutrient needs.

Growers should contact their crop advisors to learn more about these tools and understand how they might best fit their operations. Managing extreme conditions and high degrees of variability seems to be an increasing part of farming in Michigan, but producers have an array of experts and tools at their disposal.