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Split-Applied Nitrogen on Corn in a Delayed Planting Season

by Craig Reid, CCA-ON 4R-NMS

The discussions around nitrogen rates, timing and application methods in corn production typically revolve around establishing what the “right” rate of nitrogen is on a given field in a given year; and what the timing of application should be. Oftentimes, when the idea of split applying nitrogen is presented, the question invariably comes back to the economics and how much should be preplant vs how much in the later application. While those are two very important parts of the equation, and we will deal with them, they aren’t the entire story. First, by splitting, we can delay the final decision on the total N rate, second, by delaying the rate decision we can have a positive impact on the economic outcome because we have more information to work with, and finally the preplant rate is determined by our split application philosophy.

As one of the single largest line items in a corn production budget, it’s natural for the questions about rates and timings to come back to economics.

The reality is it’s relatively easy to determine the Maximum Economic Rate of Nitrogen (MERN) after the fact; but predicting it prior to planting is far more difficult due to the dynamic nature of nitrogen in our soil systems. One of the more effective strategies is to commit to splitting, and “kick the can down the road.” We can fine tune our final rate decision when the crop is developing, and after six weeks of weather data to guide us. Under favourable growing conditions, we should be aiming for the middle of the N rate range. Under wet conditions, that support leaching or volatilization, increase total N rate by 10-15% (this can be as high as 30% under extreme conditions). Under hot, dry conditions, decrease the target N rate by 10-15%. One of the most underappreciated benefits of split applying is the ability to react to what the weather has given us in the first half of the growing season.

The second part of our equation relates directly to adjusting rates in season. The closer we can get to the MERN, the better are our overall economics

on corn. By delaying our decision making, we can not only maximize yield, we also get a chance to optimize the ROI of our nitrogen dollar. While that seems obvious once we say it out loud, it usually gets overlooked when evaluating whether splitting nitrogen makes sense. That ability to get closer to the optimum rate of N will typically offset the cost that goes with a second application trip through the field.

The final component to the split application decision revolves around our preplant N rate. I usually split these into two categories. The first is “committed to splitting.” In this category we will put on 60-75% of our final anticipated N rate as a pre-plant application, and fine tune our rate in season. The second is a definite maybe when it comes to a second application. In this approach, we put on 80+% of our final anticipated N rate. If the season turns overly dry (or yield potential looks severely compromised and more N won’t address the issues) we can safely decide against an additional trip through the field. If we are into optimal growing conditions or there has been excessive moisture, then we are coming back in with a smaller top-up. Neither approach is necessarily better than the other, and choosing which approach to take will be dependant on soil type, rotation and risk tolerance.

To finish we come back to the title. Why does this matter even more in a wet, delayed spring? One is logistics. In a compressed spring going from a full preplant to a lower rate helps everyone cover more acres in a day and get the crop in faster. The second, is you can put your nitrogen program on autopilot during the spring. Decide on one or two N rates for your early season program and leave all the fine tuning to later. Hopefully, once the pressure of planting is off, everyone has more time to pay attention to the details and reduce the chances of putting the wrong rate on the wrong field. In today’s world, with an ever-increasing focus on responsible nutrient applications, split applied nitrogen offers opportunities for increasing the bottom line, and matching N rates that are much closer to crop requirements.

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