

# Burrus Buzz

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## Nitrification Inhibitor Clarification

by Matt Montgomery

Burrus recently produced an article on the use of nitrification inhibitors with spring applied anhydrous. We asked if it was necessary. In that article, we reviewed soil chemistry, said the answer was “usually no,” and made the following statement:

“To apply a nitrification inhibitor in the spring might actually keep that nutrient in a form the plant can’t so easily access”. In other words, a nitrification inhibitor in the spring will keep nitrogen from being as readily available to the plant when it needs it the most. That can equal yield loss. For this reason, Burrus does not recommend nitrification inhibitors with spring applied anhydrous in the majority of the Burrus footprint.”

### **Our comments in that article require some correction and clarification.**

Let us begin first with “correction.” Upon reading the article again, my statement (Matt Montgomery’s statement) that spring use of an inhibitor “can equal yield loss” smells a little dramatic. Are there scenarios where this type of yield loss can occur? Yes. There are undoubtedly scenarios where this would happen. This is what I attempted to recognize in our article. Is that scenario likely most of the time? No, I honestly don’t think it is. The term “can equal” (although intended to sound less than definitive) was still too definitive. You predict the year and I can predict how likely that scenario is. The nitrogen cycle is just too dynamic to make any statement that sounds remotely close to a blanket statement. Additionally, we know that nitrogen can be taken up as ammonium (less easily lost N) and nitrates (easily lost N). While nitrate is pretty easy for the plant to pull in, a high ratio of ammonium to nitrates is not a deal killer for yield. It’s just less convenient. Do we want nitrates present at some point? Sure we do. As you can see, trying to address this complicated topic in several paragraphs is just not an easy task.

Our comment stating that we “do not recommend nitrification inhibitors in the spring” also smells a little dramatic in hindsight. In fact, a statement for or against the practice probably simplifies the topic too much. Following publication of that article, I contacted Jean Payne (IFCA President) and Dr. Howard Brown (Growmark). Both are dear friends that I respect greatly. Jean noted that we really should think of this topic as an “enhanced stewardship” topic. A grower should ask himself or herself if they want to do an even better than standard job at stewardship. If they want to go a step or two steps further, spring nitrification inhibitors may be an option. Spring application of an inhibitor is often looked at as a possible “insurance policy against a late, wet spring” especially in the northern half of our footprint. So is a spring nitrification inhibitor absolutely necessary? No. Should the practice never be on the table/should it never be a possibility? The answer to that one is also “No.” A grower should consider the level of N risk they are willing to take on. A grower should also consider stewardship needs. A grower should consider if they farm within a priority watershed where water quality has become an issue. Only after doing so can they answer the nitrification inhibitor question.

Now that we have recognized a few overstatements, we should make important “clarifications.”

We spoke of not recommending nitrification inhibitors in the “majority” of our footprint and we said the practice was “usually” not required. Both statements mean that there are exceptions to the general statement. We did not provide any examples of those exceptions, and we wanted to clarify those exceptions here. The following quote from the Illinois Agronomy Handbook proves useful:

“...preplant applications of inhibitors may be beneficial on nearly all types of soil from which nitrogen loss frequently occurs, especially on sandy and poorly drained soils...”

Once again, this means that a grower must consider the environment they tend to deal with and must consider past experience before a decision to apply or not apply a spring nitrification inhibitor is made. Do their soils stay wet? Do their soils tend to be prone to leaching? Are they located in a priority watershed?

### **Another important clarification follows related to the following quote:**

“We would recommend that nitrogen fertilizer be applied only as anhydrous if applications occur more than a couple weeks ahead of planting.”

The key phrase there is “more than a couple weeks ahead of planting.” I would agree that 28, 32, etc. are all options as you get closer to planting. However, right now (this far out from planting) – any application that has a portion of its N in the nitrate is trouble. Anything with a portion of N in the nitrate form at application time is a disaster waiting to happen this far out.

This far out, the product has to be anhydrous because it will go in the ground and none of it is in the nitrate form. The initial pH spike will stall denitrifying bacteria for a brief period. Then they will begin to convert ammonium to nitrite to nitrate, but there will at least be a delay. The other noted forms of nitrogen will have no conversion delay (at least for a significant portion of the applied product). Do any of the other options this far out and your risk of loss is incredibly high once you throw in spring rains. If anything has a better chance of holding off conversion, anhydrous does. Apply any other N option (I mean ANY other N option) this early, and you will probably lose a good portion of it.

Furthermore, we should recognize that spring rains may devastate spring applied anhydrous regardless of the presence or absence of an inhibitor. When rainfall in the spring goes “exceptionally above normal,” nitrogen is just going to be hard to keep in place – period. In those situations, rescue applications of N (think 20 to 30 pounds at the most) may be necessary to maintain yield.