

# MESSENGER-INQUIRER



## Urea or Anhydrous Ammonia

A majority of the nitrogen applied prior to corn planting in our area is in the form of anhydrous ammonia. Urea is also an effective nitrogen source but its cost is typically greater than anhydrous ammonia, until this year. This year, prices for urea nitrogen sources are substantially less than anhydrous ammonia which has led to many conversations with people who are considering switching to urea for significant savings. This may not seem like a big decision to make, especially considering we know urea works and is less expensive, but indeed it is a big decision.

If anhydrous ammonia has been the nitrogen source used over the years, they have the equipment and resources in place to get the job done. Converting to urea either requires investment in different application and transportation machinery or counting on a custom application service to get the job done. There is also the reluctance to change simply because we grow comfortable doing what we always do. Change, even a nitrogen source, can be scary with crop yield at risk. The fact of the matter is, either nitrogen source, anhydrous ammonia or urea is an effective source of nitrogen for corn. There are pluses and minuses to both.

For anhydrous ammonia, there is an additional application cost as the activity is slow, and has a substantial horsepower and fuel consumption requirement. You might say what does that matter, I already own the applicators and tractors to put it down. Well, if they are not used, there

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is less cost than if they are used. Second, anhydrous should be applied at least two weeks ahead of planting to ensure soil pH in the application zone has returned to normal prior to the roots entering it. A benefit of anhydrous ammonia is that it is injected beneath the soil surface meaning rainfall or tillage is not required to move it into the soil, and the risk of volatilization is eliminated. Another benefit of anhydrous is uniform distribution because of how it is applied. Also, machine technology controls output based on ground speed to prevent excessive application and GPS valve controllers prevent overlap.

For urea, there is less application expense as the activity is fast and efficient. But additional transportation of product to the field is required as it is less concentrated than anhydrous ammonia. Distribution of urea from spinner spreaders will not be as uniform as a full width anhydrous tool bar. Half-rate split application is more accurate if time allows. Also, product overlap with spinner spreaders is unavoidable. Ideally, urea would be applied with an air distribution boom delivery system, but those are limited in our area. Another limitation of urea is that it is deposited on the soil surface, resulting in the need for rain or tillage to move it into the soil. If conditions are hot, moist soil, and sunny at the time of application, volatilization loss can occur. A benefit of urea over anhydrous ammonia is that it can be applied right up to or soon after planting occurs, there is no planting delay or need to apply it well in advance of planting.

A worry with applying nitrogen pre-plant is the risk of loss if soil conditions are wet for long periods between application and when corn can take it up. There are additives available to help delay the risk of volatilization loss from the surface such as Agrotain and denitrification loss from beneath. A good nitrification inhibitor such as N-Serve (nitrapyrin) or Centuro

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(pronitridine) for anhydrous ammonia is an option to delay the conversion from ammonium to nitrate. If the forecast is calling for an extended wet period after planting, urea at-planting may benefit from Instinct NXTGEN (nitrpyrin). Three weeks after application, only 20% of anhydrous ammonia is in the nitrate form, and just 10% if a nitrification inhibitor was used. At six weeks, 65% will be in the nitrate form, and 50% if a nitrification inhibitor was used. Urea will be 50% nitrate in three weeks, and 75% nitrate in six weeks. Urea with Instinct will be 30% nitrate in three weeks, and 70% nitrate in six weeks.

Everyone has their preferred nitrogen source and application window which is relied on year after year and most will admit they think yields are better with their product. The reality is, corn doesn't know the difference which form was used as it takes up nitrate and a little ammonium derived from whichever source was used be it anhydrous ammonia, urea, uan, ammonium sulfate, or dap.

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