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Nitrogen Questions???

***DeltAg* Product Brief**
May 19, 2009

The Big Question: "How much Nitrogen do I have remaining after all these rains?"

How much nitrogen can be lost when soil-water saturation reaches 100%? Some experts say as much as 3 to 5 % per day. I do not disagree with this thought. BUT, this loss is AFTER conversion to Nitrate Nitrogen.

After working with thousands of acres of cotton and corn with soil testing, crop monitoring and soil nitrate testing from 1978 through 2002, here are the factors and procedure we utilize here at ***DeltAg***.

Facts: Erosion of top soil that contains nitrogen is definitely lost nitrogen if the application is recent and has not had a chance to convert or move deeper.

Nitrogen leaches out of the top soil profile ONLY in the nitrate form.
Applied nitrogen MUST convert to Nitrates BEFORE it will leach away.
This conversion process takes time. The warmer and dryer the soil, the quicker the conversion. The cooler and wetter the soil, the slower the conversion.

Conversion Process

(urease enzyme) **(amylase enzyme)**
Urea ….. converts to …… **Ammonia** …..... converts to ….. **Nitrate** (available to crop & leaching)
(Approx. 7-10 days) (Approx. 7-10 days)

Urea conversion to Nitrates takes 14 to 21 days depending on weather conditions if in the soil and not on top.
Ammoniated nitrogen takes 7 to 10 days to convert depending on weather conditions. But remember, liquid nitrogen is typically a formula of 50% urea and 50% ammonium nitrate (25% ammonia & 25% nitrate)
Once in the soil profile, Nitrate Nitrogen is immediately available to the crop and accessible to leaching!
Urea applied on top of damp ground and not rained, watered or incorporated in, can melt to a liquid and then gas off or volatilize and be lost in the atmosphere. As much as 50% could be lost in 4 to 6 days (warm, dry weather).
Nitrogen Stabilizers: Normally considered to inhibit urease enzyme function and considered to stop that process for 30 days. Again, this also depends on weather conditions. **However, they DO work!**

***DeltAg* Procedure:** Place Nitrogen application dates on a calendar and use the above information to determine IF your nitrogen application has been applied long enough to be at risk of leaching and if so, for how many days of total saturation was it exposed as Nitrates. When a Nitrogen Inhibitor has been used, add 24 to 30 days to the 14 day normal conversion. Then look at initial heavy rain saturation date. Post the conversion date on the same calendar. Then count days AFTER conversion date, of exposure due to water saturation and reduce by 3% per day.

Frankly, for most liquid nitrogen or dry urea (untreated) applications made before April 15th, we have a high risk of substantial loss. With overhead urea applications with Inhibitor, we could be safe from major nitrogen loss on applications as far back as April 1st.

The Key: How much exposure after Conversion? This is not perfect science! If the applications were earlier with great exposure, consider pulling 24" nitrate soil samples, but after the final conversion date and decide how much is needed to finish the crop. Unfortunately, this may be June 1st or later……..too late for any real impact. This is the best method we have found in all these years and, honestly, it is an 'educated' guess that will at least, put some of your growers at ease about their remaining nitrogen.

Hope this helps…….Johnny McRight, ***DeltAg***