

Weekly Article

3-28-2022

Determining Nitrogen Rates

Hello, my Name is Richard Purdin with OSU Extension, Ag and Natural Resource Educator and Community Development Educator for Adams County. I hope to better inform local producers and the public of the latest news in the world of agriculture. It is hard to believe but March is wrapping up and April is beginning. Spring has officially begun even though the weather feels more like winter as I write this article. March has been a very inconsistent month with temperatures ranging from 75°F to as low as 10°F but according to climate records the month of March has been above normal for temperatures and above normal for precipitation. Outlooks for the first week of April looks to be cool and wet. As we quickly approach planting season many farmers are having to make some very tough decisions regarding planting decisions, herbicide options, and fertilizer applications. This past Monday I finished up my last fertilizer applicator recertification training and one of the main topics I discussed was nitrogen application rates. Nitrogen is one of many critical nutrients for plant growth. Nitrogen plays critical roles in plant cell formation and division. When adequate amounts of nitrogen are provided to growing crops, yield and quality can be increased dramatically. But the age-old question is, how much nitrogen is truly needed to reach optimum yield? Here are some key points that I discussed with my applicators and anyone who invest money in nitrogen fertilizer this spring should take in consideration.

1. **Nitrogen is not very stable-** Nitrogen likes to move in many ways. Losses can come from leaching through the soil profile, denitrification, and volatilization. Forms of Nitrogen available to crops is NO_3 (Nitrate) and NH_4^+ (Ammonium), Ammonium forms of nitrogen can be held by clay particles until soil temperatures warm to 50°F, this is when biology in the soil will help convert ammonium to Nitrate or NO_3 . Much of our atmosphere is made up of nitrogen due to the volatilization of nitrogen.
2. **Nitrogen can be stored in soil organic matter-** There is a great incentive to build up your soil organic matter. Think of this as a nitrogen bank that withdraws can made a little at a time as bacteria break down organic matter and release nitrogen through the growing season. There is roughly about 10 tons of organic matter per 1% OM soil test level. 10 tons of organic matter is thought to have about 1000 lbs of nitrogen, through mineralization this is broken down and made available to the plant very slowly. Soils with organic matter level of 1% would provide about 20-30 lbs of nitrogen to growing plants per year if you can build soils OM levels to 3% that number would go to about 60-70 lbs. available to the plant.
3. **Timing is everything-** Since Nitrogen is Hyper and likes to move applying it to a growing crop and when the crop and utilize it to its full potential is critical. Avoid

one and done applications, this is advantageous to many producers due to time and labor constraints. Research has shown that when side dressing nitrogen to corn during growth stage VT-R1 (tasseling and silking) has great benefits to yield. For forages much research has been done with delaying nitrogen rates until jointing and upright growth (Mid spring rather than early spring). Watching the weather should not be forgotten, nitrogen needs moisture to become plant available but too much moisture can create great losses and pollution to water ways and sources.

4. **Think about economics first-** When making application rate decisions, make sure to apply based off economic return on investment rather than potential yield. The school of thought of 1 unit of N per bushel of corn or small grain yield has been restructured to utilize economic return, with Nitrogen rates hovering around \$1.14/unit and corn prices around \$6.50/bushel, economic return on investment would be close to 135-140 units of nitrogen to produce 95% of maximum yield potential.

Some other details to go over

- April 9th, 9:00 am to 3:30pm Adult Mental Health First Aid training sponsored by Adams County Farm Bureau. This training is for those who work with or for those in the agriculture production sector or rural adults in general. This training will allow you to understand the warning signs of mental health challenges and how to get the person struggling help. Please contact the Adams County Farm Bureau office at (937) 378-2212 to RSVP by March 28th. Meeting location will be at 325 West State Street Georgetown, Ohio 45121 and lunch is included.
- April 13 6:00-8:00pm Small Ruminant School hosted by W/C Milling LLC, event location will be held at the Seaman Community Center 17806 State Route 247 Seaman, Ohio 45679. Please RSVP by April 6th by calling the Adams County Extension office at (937) 544-2339.
- April 20th 6:00-8:00pm Forages for Horses Pasture walk located at David and Kimberly Baker Quiver Heart Preserve 2655 Steam Furnace Road Peebles, Ohio 45660. Cost is \$15, please RSVP by April 15th with OSU Extension Adams County at (937) 544-2339.