nutrient stewardship

Nitrogen Loss Pathways — Which is Yours?

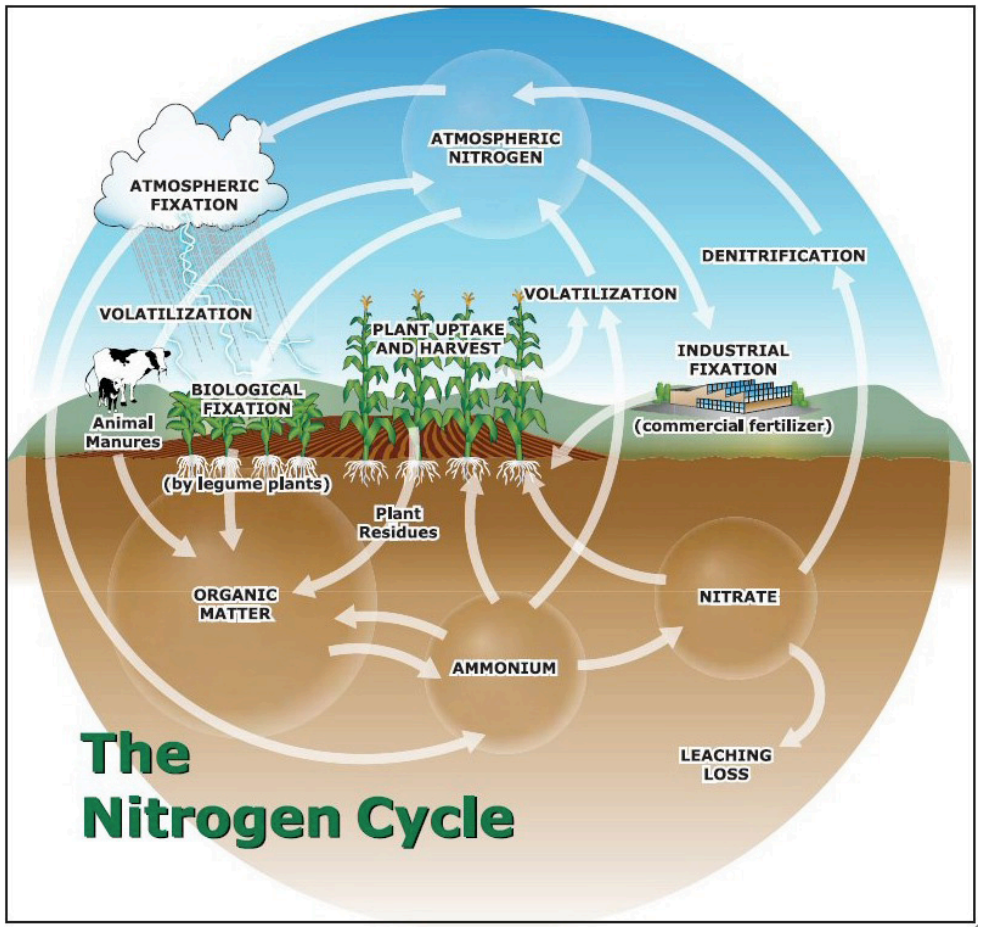
THIS ARTICLE IS ABOUT...

RIGHT SOURCE RIGHT RATE RIGHT TIME RIGHT PLACE

Weather hinders perfect N management

- Determine your most significant N loss pathways
- Focus on addressing those pathways with BMPs

The well-known poem by Robert Frost, "The Road Not Taken", kindles our imagination about the richness of life gained by taking the less traveled paths. While it may seem a far reach, this "less traveled path" metaphor also pertains to you and the N nutrition of your plants; whether you are a professional turf or crop manager, or a hobby horticulturist.



Greater fertilizer N costs and knowledge of the environmental impacts of N losses are driving us all toward better N stewardship. Weather, or the lack of its control, hinders us from perfect N management. But weather variability should not prevent us from striving for lower losses down the "more traveled N loss pathways".

The nitrate leaching and drainage N loss pathway is probably the "more traveled" in humid, higher rainfall environments (>25 to 30 in./yr). Nitrate losses under annual crop systems may range between 10 and 40 lbs of N/A/yr in higher rainfall environments. Nitrate losses under deep-rooted perennial crops are often lower. If rainfall, irrigation (>½ in. within a few days after application), or tillage do not soil incorporate surface-applied urea or urea-containing N fertilizers

within a few days after application, ammonia volatilization (gaseous loss as ammonia) may range from 20 to 40% of the N applied, and rival N losses from leaching and drainage. Recent research has shown that such ammonia volatilization losses can also occur if urea is applied on snowpack or wet soil surfaces in colder environments.

Gaseous loss of N from soils as nitrous oxide (a potent greenhouse gas affecting climate change), through nitrification and denitrification processes, is often <2 to 8 lbs of N/A in humid regions and may be <1 to 2 lbs/A in less humid regions (e.g. west of the Mississippi River). While this N loss is globally important, it may have small economic significance to the majority of individual landowners and crop producers. Loss of N_2 during denitrification, especially in wet fine-textured soils with poor internal drainage, is a more prominent N loss compared to nitrous oxide.

From an economic vantage point, the focus for most of us should be on the "more traveled N loss pathway" in our own particular plant and soil system. That means taking management action to reduce the risks of loss via nitrate leaching/drainage or ammonia volatilization. To start, we need to better understand the characteristics, properties and best management practices for the N fertilizers we may choose among.

Consider visiting the Nutrient Source Specifics articles available on-line at **www.ipni.net/specifics** and talk with your nutrient supplier, crop adviser, or agricultural professional to learn more about the N fertilizers available for your use. Identify ways to prevent N loss down the "more traveled loss pathways", and get more in your plants. Your bottom-line will improve and our water and air resources will be better protected. Dare to venture beyond your past boundaries, and choose the "less traveled pathway" toward higher N use efficiency this year!

The Fertilizer Institute
Nourish, Replenish, Grow

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The guidelines for the 4R principles are endorsed and supported by the International Plant Nutrition Institute, The Fertilizer Institute, The Canadian Fertilizer Institute, and the International Fertilizer Industry Association. ***www.nutrientstewardship.com.***

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Dr. Cliff Snyder, "Nitrogen Loss Pathways — Which is Yours"

Plant Nutrition Today — Spring 2012, No. 6;
www.ipni.net