

4waRd Thinking Conversations

Top 4 – January Edition

Soil testing is the foundation for fertility. The *Law of the Minimum* states that yield is proportional to the amount of the most limiting nutrient, whichever nutrient it may be. January conversations should focus on creating a fertility plan that addresses yield-limiting nutrients. Helping farms to ensure nutrient balance and alignment will ensure that soil fertility will meet the yield goals of an operation and keep them in compliance with regulations.



Why it's important...

1 Nitrogen (N)

Nitrogen is the key to building plant proteins and enzymes. It's the most important nutrient in plant growth. However, it is not a nutrient directly reported on a soil test. Some testing labs will report ENR – Estimated Nitrogen Release, calculated from the sample's soil organic matter (SOM) and average mineralization rate. The calculation is as follows: $2,000,000 \times \% \text{ SOM} \times 5\% \times 2.5\%$. It's a starting point for understanding nitrogen contributions from stable forms of SOM.

2 Phosphorus (P)

Phosphorus is the key element for regulatory compliance with respect to PA water quality regulations. It's also vital to plant reproduction and essential for seed production. Because it helps a plant to resist cold and disease, it's a critical nutrient for spurring early and rapid root growth and young plant development. Optimized P levels impact and improve efficiency in N uptake.

3 Potassium (K)

Potassium plays a key role in many physiological processes of the plant. It is key for the movement of water, nutrients and carbohydrates needed for growth. In addition, it is the key to strong stalk strength in corn and can help to fight some diseases in soybeans. Low potassium can lead to higher drought stress in crops.

4 pH

pH is a measure of the soil's acidity. Root development, nutrient availability and herbicide activity are all dependent on maintaining adequate pH. After pH is optimized, look at Magnesium, Calcium and other micro-nutrient levels.

How to start the conversation...

How are your soil organic matter levels? Increasing OM through time implementing soil health practices can positively influence nitrogen contributions from your soil.

Can we talk about your phosphorus levels and what they mean for maximizing yield & minimizing regulatory issues?

Most crops require an equal amount of potassium and nitrogen. Double check your K levels to make sure high enough to meet crop demands.

Keep a close eye on your soil pH. Remember, pH is reported in a logarithmic scale – a soil pH of 6.5 is 3x higher than a soil pH of 6.0!

