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Stability of pH & BpH

The past couple seasons we've observed some fluctuations in pH and BpH throughout the course of a season (as well as year to year). Generally, the BpH is very stable and reflects very little change from year to year outside of changing soil-types. Once the SMP buffering solution (7.5 pH) is added to the soil, the BpH is the end result and identifies reserve acidity. On the other hand, pH represents the amount of hydrogen in the soil and may display *some* variability - most often due to changes in moisture. Organic matter in excess of 10% can be difficult to buffer, but may also present variable levels of acidity. Generally, dry conditions can reflect a lower soil pH, whereas, wet and saturated conditions may trend a little higher. Either way, the BpH will remain relatively stable. Heavier clay soils (higher CEC) can vary .1-.5 pH units. Lighter soils containing less clay (lower CEC) can potentially vary .5 to 1 pH units.

In 2006, dry conditions in Iowa resulted in 0.3-0.5 lower pH units through the course of the season. In the Spring/Summer 2007, some MN soils saw similar changes, but now with the addition of moisture (and some saturated field conditions), the pH levels appear back to normal or even .1 to .3 pH units higher than normal. Still, the BpH levels have changed very little. It's normal to see pH and BpH reported with a .7 to .8 unit spread, but this Fall in southern MN, we've seen certain soils displaying a mere .1 to .3 spread.

Review of pH and BpH

- Soil-test: pH uses a 1:1 (soil:water) mix and is measured by electrode.
- pH measures the hydrogen ion (acid forming) concentration in the soil.
- BpH (buffer pH) measures reserve acidity and indicates the amount of lime needed for production needs.
- SMP buffering solutions represent a 7.5 pH. When added to acid soils, the pH of the buffer will drop. This is the BpH and reflects lime needs.
- Soil pH of 6.0 or higher may display an inaccurate BpH. Standard guidelines are recommended.
- Lime applications help displace the hydrogen ions in the soil-reducing acidity.

Compaction – Caution

Fall rains have generated some saturated soils across the northern plains. These conditions expose our soils to potential compaction concerns as harvest progresses. The impact on soil nutrients can be extreme in higher clay soils. Potassium, for example, may become bound in stratified soil layers (top-soil and subsoil) for several years and may require supplemental potash applications in the short-term. In conjunction, deep tillage operations in *non-saturated* soils help alleviate compaction. Common sense tells us to reduce trips across the fields when conditions are conducive to compaction, but that's easier said than done. "The value of today's patience is tomorrow's profit".

Jeff Foxworthy: If you consider it a sport to drill a hole through 24" of ice and sit on a 5-gallon pail all day believing dinner will swim by, you might live in Minnesota.

Jeff Foxworthy: If you design your kids' Halloween costumes to fit over a snowsuit, you might live in Minnesota.