

September Newsletter



Food for Thought: Soybeans

The expression "corn is king" is one that often comes up when discussing corn production. It's a crop that is easy to grow, yields well and brings a buck to the bank. However, I think the time has come for another crop to overthrow the crown: soybeans. Both of these crops have had constant genetic improvements, but one area that gets overlooked for soybean production is crop nutrition requirements. In a typical rotation, soybeans often follow corn. This school of thought can be attributed to the fact that a corn crop is fertilized quite heavily and that any residual nutrients will be available and sufficient enough for next year's soybean crop. In this month's Lakeside Newsletter, this old habit will be challenged.

It Begins with a Strong Foundation

Regardless of what crop you intend to grow, you must consider the soil that going to be home to the crop. Look at your soil nutrient/health levels like you would your house. A strong foundation is essential to any structure's build. Smooth concrete to prevent leaks or floods, a solid base for trusses and frame to be held up by are just a few things that a strong foundation provides. Having adequate soil nutrient/health levels are the foundation to your crop's house. Without sufficient nutrient levels, your crop becomes open to yield loss. Soil that is too acidic will prevent crop growth entirely. Regardless of what crop you intend to grow, you must first bring your soil levels up to adequate levels. Once you can check that box off your list, you are ready to grow a successful crop!

What is the true definition for having "adequate" levels of nutrients in your soil? Of course, this depends on a few factors, such as the cation exchange capacity (CEC) and pH of your soil. As a rough rule of thumb, you want a pH between 6.2 to 7.3 to ensure that the nutrients are most available. If your soil is too acidic, this can lead to micronutrients being tied up in the soil. If your soil is too basic (alkaline), macronutrients become very unavailable to the crop. When it comes to the CEC of a soil, you have to treat each field on an individual basis. The higher the CEC of your soil, the more it is able to hold.

How soil pH affects availability of plant nutrients.

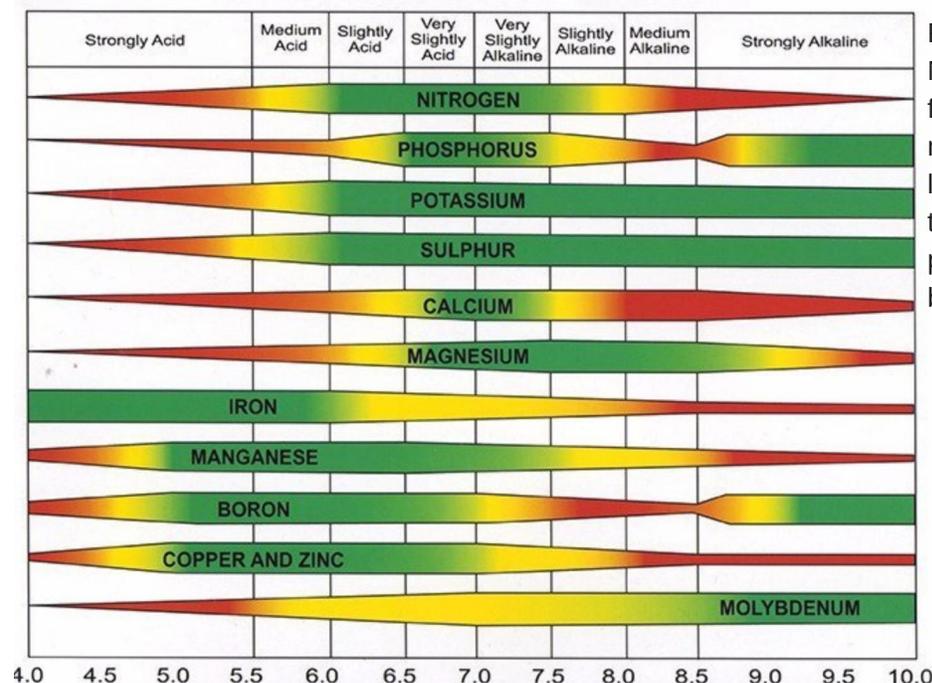


Figure 1: pH ranges for various nutrients. Note the optimal range being from 6.2 to 7.3 for most macro nutrients. As a soil becomes more acidic, these macro nutrients become less available. It is important to remember that a pH of 6 is 10 times more acidic than a pH of 7. Moving down to a pH of 5 equates to being 100 times more acidic than a pH of 7.

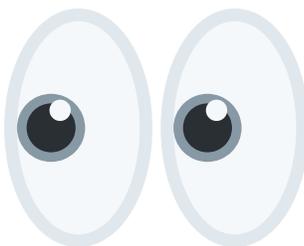
Feeding a Soybean Crop



Soybeans have a very unique relationship with bacteria because of their symbiotic relationship. The rhizobia fix nitrogen from the air into ammonia, which is a nitrogen source that the soybean plant can use. In return, the soybean provides carbohydrates to the rhizobia bacteria. Though the exact number varies, approximately 50-70% of the nitrogen requirements can be obtained from this fixation process. Knowing this, where does adding nitrogen fertilizer fit into a soybean fertilizer program? Looking at the crop's demand for nutrients in terms of crop growth stage is an excellent place to start. When pods development takes place, roughly around the R3 stage, there is a high demand for nitrogen. As the plant starts to develop and fill these pods, more nitrogen is required by the plant. There is also research showing that soybeans respond well to added nitrogen in a high yielding environment because the plant lacks the ability to supply enough nitrogen through biological fixation to keep up with the growing crop's needs.

Phosphorous and potash cannot be forgotten about in this conversation. A common crop rotation usually has soybeans following a corn crop, where the corn has been fertilized to maximize yields and it is expected that any leftover nutrients will be scavenged by the soybean crop. **News flash: soybeans aren't great scavengers!** These shallow-rooted legumes need to be treated with more respect and given the nutrition that they truly deserve. Research from Michigan State University states that the critical levels for soil phosphorous is 15 ppm and the critical level for potash is dependent on a soil's cation exchange capacity (CEC). Knowing this, for a soybean crop, soil phosphorous levels need to be kept between 15-30 ppm and for a soil with a CEC of 18, the soil potash levels should be kept between 120-150 ppm (factoring in 30 ppm for a maintenance level). Take advantage of the fall season to apply fertilizer for the following year's crop. By applying phosphorous in the fall, in the form of MAP (mono-ammonium phosphate) or MESZ (11-40-0-10S-1Zn), reduces the potential of phosphorous runoff. Alternatively, fall potash applications are not recommended on sandy soils with low organic matter due to the high risk of leaching - this proves again the importance of understanding your soil type!

**Something
You Want to
See?**



If there is a topic of interest that you would like to see in an upcoming edition of the Lakeside Newsletter, please feel free to contact me with your topic at arastapkevicius@lakesidegrain.com or 226-402-2877.