Soil Sampling & Interpretation

Soil sampling is carried out to analyze whether a soil has sufficient plant nutrients, to monitor changes in the soil properties, to determine how much additional fertilizer is needed to be applied in order to produce a given crop and it's often used as a report card of how the year turned out with regards to yield and residual nutrients left in the soil. Our main goal is to understand the soil properties and how they affect plant growth and productivity of the field. Several key properties should be analyzed and measured to see if anything can be changed or improved for future production.

First, we will start with the macro nutrients – nitrogen, phosphate, potash and sulphur.

Nitrogen is the most frequently deficient nutrient in a non-legume crops. It is a component of proteins and chlorophyl which converts light to energy for photosynthesis. Proper Nitrogen levels are needed to ensure vigorous vegetative growth and productivity. Generally, on the soil test we can count on 100% of the nitrogen in the top 6" of soil and 50% of the nitrogen in the 6-24" as environmental changes can affect how much a plant can access. Organic matter can also contribute large amounts of nitrogen into the soil pool, but many factors are involved in its release so generally its not used as part of the available N.

Phosphorus is involved in energy storage and transfer to use throughout the plants growth and reproduction. Adequate P also increases root growth and enhances maturity. Soils may be high in total P but low in plant available P, plants absorb P as orthophosphates. Crop demand is quite variable – climate, crop rotation and soil chemistry may influence P availability.

Potassium is needed in many chemical reactions, water use and uptake, transport of nutrients, protein synthesis, lodging and disease resistance. Some crops require potassium in large amounts. However, soil test K is usually greater than crop uptake but only a fraction of the soil K is available so knowing your soil type is critical in this process.

Sulphur is an important component of plant enzymes and protein synthesis. It is required to produce chlorophyl. For the most part, it is needed in smaller amounts by plants but it can be leached so it is critical to monitor for deficiencies. Other crops require larger amounts, for example canola typically needs 25-30 lbs/acre to yield 50 bu/acre.

Micronutrients are nutrients necessary for plant growth but are needed in smaller amounts to meet the crops demand.

Manganese has been called the "element of life." It is important for chlorophyl production as well as pollen germination, pollen tube growth and root elongation. It is involved in the breakdown of carbohydrates and nitrogen metabolism.

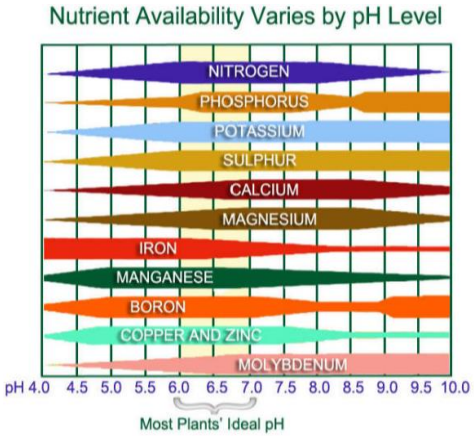
Copper is required for enzyme activation and plays a significant role in the reproductive stages of crop growth. It also helps in chlorophyl production.

Zinc is a key component of enzymes involved in metabolic reactions; aiding with germination, growth regulation and stem elongation.

Boron is important in cell structure, hormones and moving sugars. It is beneficial in pollination and reproductive development.

Iron is a nutrient essential for chlorophyll and for photosynthesis, nitrogen fixation and tissue growth & metabolism.

Chloride is a component of photosynthesis, osmotic adjustment and helps in suppression of plant diseases.



Organic Matter is also an important indicator of soil health and fertility. It consists of organic residues and nutrients that have already decomposed, called humus – contributing to the accumulation and retention of plant nutrients and water. Organic matter improves microbial activity, reduces erosion potential, reduces compaction and holds more anions. It improves soil structure and over time releases nutrients to the soil solution through mineralization. Increasing soil organic matter is a long process but using various crops in a rotation to return straw to the soil, reducing tillage, seeding cover crops and adding manure are all effective in increasing levels.

Cation Exchange Capacity or CEC is one of the most important soil chemical properties influencing nutrient retention and availability. Soil CEC represents the total negative surface charge on minerals and organic matter to attract cation nutrients in solution. In other words, it is your soils ability to hang on to nutrients. It indicates your amounts of sand, silt and clay and in turn tells you about the soil structure, nutrient availability and response to fertilizers.

CEC greater than 20 = heavier clay soils. CEC of 10 = loamy soils. CEC of less than 5 = sandy soils.

Our Sales Agronomists are typically out following your combines with our soil testing trucks to ensure we obtain the most accurate sample. Please reach out if you have any questions regarding soil testing and interpretation. Understanding your soil and the nutrients available goes a long way towards determining your costs of production. We look forward to discussing your soil with you!

Slava Dubchenko
Sales Agronomist