EARTHGEN215, LLC

ReGENerating Our Soil Today!

June 2023 Newsletter

Tidbits about EarthGen215 Application Protocols

This Newsletter briefly describes the EarthGen215 approach to interpreting information from a Midwest Laboratories, Inc. ("MWL") soil report, and using the information and interpretations to recommend applications for each growing season.

Our primary goal is to improve soil structure so hay and crop production improve both in quality and quantity. Usually, fewer weeds grow in well-structured soil. Many weeds grow best in oxygen-deficient soil, or soil that contains too much or too little of certain nutrients. Soil generally becomes better oxygenated and produces more efficiently as soil structure improves. EarthGen215 focuses most on balancing the cations, calcium, magnesium, potassium, and sodium. As those four cations move within, or at least toward the following nutrient ranges, other soil nutrients tend to shift into better equilibrium in relation to each other: Optimum Base Saturation Ranges: Calcium 70% to 75% (at least 65%; up to 80% can be functional) Magnesium 12% to 15% (can be functional up to 18%; OK up to 20% when CEC is less than 12 meq/100g) Potassium 3% to 5% (at least 2%, and preferably not higher than 8%) Sodium Less than 1% (but always lower than potassium) Additional nutrient proportions that factor into EarthGen215 application protocols include the following approximations, each being calculated using the nutrients' respective parts-per-million values: Calcium-to-Magnesium ratio 7:1 Potassium-to-available phosphorus 5:1 up to 6:1 Potassium-to-Magnesium less than 1:1 is preferred, not higher than 1.5:1 (high potassium appears in parent-soil-materials mostly in Western states) Unavailable phosphorous-to Plant-available phosphorus less than 1:1 is preferred, not higher than 2:1 The following ranges are also considered to be "ideal" by EarthGen215 for optimum production in addition to the proportional relationships above: Soil pH 6.6 to 6.9 Soil organic matter 3% to 5% (at least 2%) Very few soil-sample analyses assessed by EarthGen215 are within the ideal or optimum ranges printed above; nevertheless, as nutrients adjust and these ranges are approached, crops' production usually improve. Plant tissue analyses can give in-season feedback regarding uptake and assimilation of nutrient excesses and deficiencies.

One reason for the EarthGen215 focus on balancing the four cations is that they are the nutrients that most affect soil pH. Those four cations, again, are calcium, magnesium, potassium, and sodium. When soil pH is at or between 6.6 and 6.9, soil nutrients collectively are optimally available for growing plants' root hairs to uptake, and their plants to then assimilate. The higher pH is above 7.0 the more soil phosphorus and calcium tie up with each other. Conversely, the lower pH drops below 6.5, the more phosphorus (that is in the soil naturally as well as any phosphate material applied) ties up with iron, manganese, or aluminum. Generally, aerobic beneficial bacteria and fungi thrive where soil pH is at least 6.2. Activities of aerobic bacteria and fungi are essential for decomposing dead matter and otherwise maintaining healthy soil. For example, actinomycetes bacteria function most effectively within a pH range of 6.2 to 6.7. Actinomycetes bacteria produce a type of antibiotic in growing plants' root-zones that protect the roots from pathogenic bacteria and fungi. When colonies of actinomycetes within rhizospheres are healthy, there is no need for expensive, synthetic fungicides or nematicides. Crop production can be optimal when organic matter is at or between 3% to 5%.

EarthGen215 strives to have all of “soil organic matter” to be humus. Humus is nutrient-rich topsoil that is produced by microorganisms, earthworms, and other beneficial soil-organisms as they collectively decompose dead plants, animals, or other matter that were once living and have since decomposed beyond recognition, and have become nutrient dense, tilthy soil. Increasing humus increases soils’ abilities to hold and use water and nutrients effectively. Each 1% of soil humus holds approximately 10,000 gallons of water per acre. A one-inch rain supplies about 28,000 gallons of water per acre, so soil with a 3% humus level could hold approximately 1 inch of rain water. Increasing humus in soil improves soil granulation which, in turn improves water infiltration, internal water-movement, and internal drainage. Increasing humus builds soil structure which helps protect soil from wind and water erosion. Please contact EarthGen215 for additional information regarding the nutrient ratios on the front page of this Newsletter. Please note that those ratios are approximations and guidelines, only.

Thank you and let’s reGenerate our soil today!!

Tom

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