Soil Testing and Phosphorous
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Release: Week of November 6, 2023

Last week I wrote about soil testing. Soil testing should also be used to determine the need for phosphorous (P) in fertilizer applications. Fall is a good time to have lawn and garden soil tested.

In a fertilizer analysis, such as 10-10-10, the second number represents P. Many fertilizers contain P and this nutrient ends up being applied whether needed or not.

The reasons to test for phosphorous are many. It is an essential nutrient and should be applied if needed. However, Nebraska lawn and landscape soils tend to test adequate or high for P; and movement of this nutrient in soil is low, unlike nitrogen which is quite mobile.

The negative environmental effects of excess phosphorous are well documented, especially for water quality. And the build-up of P in soil can lead to poor plant growth. If it is not needed, it is best not be applied for these reasons.

Phosphorous promotes root growth, hardiness, above ground shoot growth and has other key roles. Application of this nutrient is often encouraged when establishing new plants and starter fertilizers high in P are frequently sold along with new plants.

Applications of P can be effective when establishing or renovating an area, especially during spring when soil temperatures are colder and moisture higher. During fall planting, when soil temperatures are warmer, the benefits of applying P to a soil testing adequate for P are reduced, while the risk to water quality is increased.

Because phosphorous is the main nutrient, along with nitrogen, that promotes excess algal growth in surface water leading to impaired water quality, it is wise to test for P and only apply it when needed.

Phosphorous enters surface water through soil erosion, run-off of fertilizer and plant debris from lawns and ag fields, faulty septic systems, and animal waste. It is unclear on how much each contributes, but excessive use of P fertilizer is a controllable factor. And deficiencies are rarely observed in established lawns in Nebraska, except on soils with very high pH.

The build-up of P in soils can lead to poor plant growth. According to Texas A&M Extension, excessive soil phosphorus reduces a plant's ability to take up required micronutrients, especially iron and zinc; even when soil tests show there are adequate amounts of these nutrients in soil. This can result in deficiencies seen as yellowing between leaf veins with iron or tissue bleaching with zinc.

A soil test is the best way to determine the need for phosphorous. Two different tests are used to determine available phosphorous. The Bray-P1 test is used when soil pH is 7.4 or less and the Olsen-P test is used when soil pH is greater than 7.4. The reading will come back as parts per million (ppm).

For example, a level of 25 to about 50 ppm is considered sufficient. A starter fertilizer would be recommended if the level was below 25 ppm.

Soil testing every few years to base soil management and fertilization decisions on is smart gardening. There are a number of soil labs in Nebraska. For a list, contact your local Extension office or search online for Nebraska soil labs.

Basic soil tests are inexpensive, about $15 to $20, and sampling is easy. A basic soil test measures pH, organic matter content, cation exchange capacity (CEC) and levels of nutrients like nitrogen, phosphorus and potassium among other things.