Phosphorous Important but Often Not Needed

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During the fall and spring planting season, starter fertilizers or bone meal are often promoted for incorporating into soil. The reason is to supply phosphorous (P) to promote root growth.

While P is an important plant nutrient and does promote root growth among other things, this nutrient is rarely lacking in garden and landscape soils. And too much soil P can lead to problems.

One issue is negative effects on plant growth. Excess P can cause iron or zinc deficiencies in plants, especially in alkaline soils. A symptom is chlorosis which is yellow leaves with darker green veins. While we often talk about this being due to high pH soils tying up iron, excess soil P is also be a factor.

High soil P can also lead to stunted plant growth. One reason this might be is because excess P inhibits soil mycorrhizae. These are beneficial fungi that help plants absorb water and nutrients.

A second issue is movement of P into surface water via wind and water erosion of soil. Nutrient loading of water leads to excess algal growth negatively impacting ecosystems. For this reason, some states have banned the use of fertilizers with phosphorus on established lawns unless a soil test indicates it's needed.

A third issue is the waste of money and labor if P is not needed. When garden and landscape soils are tested, P levels are often very high and the lab recommends stop adding P until levels decline. Phosphorus is also a finite resource. To preserve this natural resource, it should only be applied when needed.

Phosphorous levels are high in garden and landscape soils due to the addition of synthetic fertilizers containing P, the use of bone meal, and the annual use of organic matter like manure-based composts. All are good products when needed, however, soil tests need to be done every few years to determine nutrients needed.

Unlike nutrients like nitrogen or potassium, phosphorus doesn't leach out of soil. It is tied up by soil minerals and slowly released to plants. After years of fertilizing with a complete fertilizer like 10-10-10, animal manures, or other composts, P builds up to high levels and it can take years for them to lower.

On fertilizer bags, the amount of nitrogen, phosphorous and potassium is shown as 3 numbers such as 10-10-10. The middle number represents P. Unless a soil test indicates phosphorous is needed, select one with the middle number being zero. For example, blood meal is 12-0-0 bone meal whereas is 0-10-0.

If soil phosphorus levels are above 25 (Bray test) or 18 (Olsen test), do not use a phosphorus-containing fertilizer for a few years; then soil test to determine when P is needed.

On a soil test, take note of organic matter percentage. If it shows organic matter at 5 percent, stop adding compost or rotted manure for a year or two. When adding compost, spread a 1-inch layer on the surface to till into soil. If a soil test shows organic matter percentage to be much lower, spread a 2 to 3-inch layer.

Growing a cover crop in a garden can help reduce P. These provide nitrogen and build soil health without adding extra soil P. Legume cover crops prefer soils high in P and fix their own nitrogen (N). When they die and decompose, they increase soil organic matter and release organic N to soil.

If a soil has not been tested for the last few years, fall is a good time to do so. There are a number of private soil labs in Nebraska and the cost for a basic test can range from $20 to $30.