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News Column
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PHOSPHORUS FERTILIZER FOR CORN

Phosphorus is a critical nutrient for early season plant root growth and shoot development. When phosphorus is deficient, the older plant leaves will usually turn a purple color due to anthocyanin pigments accumulating in older leaf tissue. While this is rare beyond the seedling stage, I have seen in several fields where the Phosphorus soil test level was 3. If the phosphorus deficiency is severe, plants later become stunted and lower yielding.

Warmer temperatures increase natural mineralization of phosphorus from the rock, clay and other minerals within the soil for plant growth. Our soils are rich in phosphorus with levels up to 3,000 pounds per acre. In order to become available to the plant this native phosphorus needs to be mineralized each year. This soil mineralization may seem like producers are “getting something for nothing” and may seem like a logical fertilizer cost savings for producers facing lower commodity prices. However, before producers start lowering their phosphorus fertilizer rates based on lower commodity prices and potential increased winter mineralization, Charles Shapiro, Nebraska Extension Soil Scientist, shares this research finding. After comparing long-term phosphorus soil storage levels in Nebraska, Dr. Shapiro has concluded that our statewide average stored phosphorus soil content levels has been decreasing each year by about 10 pounds per acre for at least the past twenty five years.

Why this decrease? First, consider that corn yields have almost doubled in the past 25 years. When harvested, each bushel of corn contains about 0.35 pounds P₂O₅ (phosphorus); thus, corn fields now yielding an extra 100 bushels per acre will remove an additional 35 pounds of phosphorus from the field each year in grain harvested. Livestock manure applications have decreased during the past decades for many farms. Thus, less phosphorus has been moved back onto the fields in the manure to replace nutrients taken away or harvested in grain and forage. For some operators tillage adding to erosion losses has also been a factor.

The target “critical soil phosphorus content levels” may need to be adjusted higher. For example, based on an 8 -inch soil sample, past University of Nebraska “deficiency correction” recommendations have been maintaining a soil phosphorus content level of 15 ppm (30 pounds) per acre. This target soil level we recommend today is to 20 ppm (40 pounds) per acre based on these new soil phosphorus storage state average findings. More information regarding corn fertility and rates is available on our Nebraska Extension website <http://cropwatch.unl.edu>

This still leaves room for many farmers to reduce phosphorus applications without yield impact at this time of tight returns. This could involve reducing broadcast applications, adjusting starter fertilizer type and rate, and utilizing manure more precisely.

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