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MANAGING PHOSPHORUS FOR SPRING WHEAT

What does phosphorus do for spring wheat? Phosphorus is important for establishing tillers and proliferating roots. Early in its growth, the root system of wheat is limited. However, it is during this time that wheat decides how many tillers to develop. Because the young root system doesn't explore much soil, an early season supply of phosphorus placed near the seed has proven successful. Yield increases from bands of phosphorus near the seed have been reported in several published studies, even at higher soil test phosphorus levels.

Is band placement the only option for spring wheat? No. Extensive research from the Great Plains shows that one-time broadcast applications of modest rates of phosphorus can contribute to wheat nutrition for several years in the future. When phosphorus is applied to soils high in calcium and/or magnesium, compounds are formed that are available to plants over time.

Which is better, band or broadcast applications? In the year of application, banding with or near the seed generally outperforms broadcast applications, pound for pound. However, the superiority of one placement option over the other isn't so clearcut when considering the impacts in future years. Phosphorus placed near the seed is important for early season growth and final yield, but higher soil fertility is also important later in the season. Combining phosphorus bands near the seed with adequate soil fertility is probably the best long-term strategy.

Can I build up phosphorus soil test levels in the Great Plains? Yes. How far you can build them will depend on local conditions. A larger broadcast application is expected to build soil test levels within a year. If no additional phosphorus is applied in future years, soil tests associated with this type of application will decline over time. Repeated banding of phosphorus with the seed will, over the years, increase soil test phosphorus levels. How much soil test levels increase will depend on how much phosphorus is applied vs. how much phosphorus is removed by the grain at harvest. To build soil test levels, you generally need to apply more phosphorus than is removed.

How much phosphorus is removed by spring wheat? Actual amounts removed per bushel will vary depending on local conditions. However, a frequently used estimate is that about 0.5 pound of P_2O_5 per bushel is removed by wheat. So a crop yielding 40 bushels per acre will remove approximately 20 pounds of P_2O_5 per acre.

Deciding how to manage phosphorus will depend on the farmer's objectives. Strategies to maximize short-term returns will best be met with banded applications near the seed. Longer-term strategies for increasing attainable yield potential may best be accomplished by building soil fertility while continuing to band phosphorus near the seed each year.

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