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WINTER WHEAT AND PHOSPHOROUS

Winter wheat responds more to phosphorous (P) fertilization than any other major crop in Nebraska. Now is the time it really shows. Although only small amounts are taken up by wheat early in the season, P plays a major role in early plant development and determination of attainable yield potential.

When wheat came out of dormancy this spring, during the first few weeks, the P supply increases the proliferation of roots as well as the initiation of tillers. An insufficient supply of P early in the season creates irrecoverable yield losses. Phosphorus shortages later in the season have less impact than those encountered earlier. Cool soils in the spring of the year impact the availability of soil P supplies, even when fertilizer P has been applied. As soils warm, not only does more soil P become available, but hastened root growth increases the plant P uptake potential.

Classic symptoms of early season P deficiency is reduced leaf and tiller development, off color wheat (sometimes confused with lack of Nitrogen) and a slower rate of growth. Root systems of young plants are very limited. Consequently, adequate P supplies must exist around the developing roots of the young plant to ensure proper P nutrition and the initiation of yield-determining tillers.

Starter fertilizer at planting time in the fall is recommended because it is an extremely efficient way to get phosphorus available for the crop. The soil test levels for phosphorus in area fields can easily vary from 7 ppm to 50 ppm using the Bray P1 soil test method. If the soil test level is below 25 ppm, supplemental fertilizer is going to be recommended. Most soils will have soil test levels above 15 ppm and will require 20 pounds of phosphorus banded with the seed or 40 pounds broadcast.

As an example 5.5 gallons of 10-34-0 will supply 20 pounds of phosphorus, or 40 pounds of 11-52-0 would supply 20 pounds of phosphorus. However, research has shown, banding is twice as efficient as broadcast.

The reason it takes more fertilizer broadcast to get the same yield result is a matter of soil chemistry. The soil will tie-up phosphorus and mineralize or release phosphorus depending on soil test level, season of the year, soil organic matter and many other factors. Broadcast applications increase soil contact area for tie-up and reduce the chances a root will grow in the area and take up the phosphorus before it is tied-up.

Fields which have thinner soils and/or more erosion history are likely to have low soil test levels and need more fertilizer applications. It is important to note soil test levels below 15 ppm should have 40 pounds of phosphorus application in a band or 80 pounds broadcast in the fall. Eighty pounds of P is expensive but so is leaving potential yield when prices are booming.

Because of the increasing cost of phosphorous fertilizer, consider in your future plans to place phosphorous near the seed in a band or with the seed. In a fall like last year, farmers had an



advantage who were able to plant wheat at the proper seeding depth and place the fertilizer with or beside the seed. Winter wheat is an excellent high carbon, rotational crop and understanding the importance of P is a big key for high yields.

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