You Couldn't Apply Phosphorus and Potassium Last Fall and Now It's Too Wet?

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Winter came early last fall and perhaps you couldn't make planned phosphorus and potassium applications. And, you couldn't make applications during winter because of heavy snow cover. Now soils are wet and there is little time until corn planting begins. Also, fertilizers are in short supply and at high prices. So what should you do? There are a few viable options depending mainly on soil-test values and the particular crop. Most likely there is time for application if the crop is soybean or pasture, because either you applied the needed P and K before last year's corn or have a few more days to fertilize this spring. You may have a tough situation for other crops such as oats, corn, or spring wheat, especially for oats and spring wheat because you should already have them planted.

Your best option is clear if most of a field tests in the High or Very High soil-test category established by Iowa State University (see ISU Extension publication PM 1688, *A General Guide for Crop Nutrient and Limestone Recommendations in Iowa*). For soil series with low subsoil P and K (most in Iowa), the High category for P determined with the Bray-1 or Mehlich-3 P methods is 21 to 30 ppm and for K by the Ammonium Acetate or Mehlich-3 methods is 171 to 200 ppm. No P and K fertilizer is recommended for any grain crop in these categories because the probability of a yield response to fertilization is very small for High and almost zero for Very High. Only starter for corn is recommended for specific situations, for example with no-till and thick residue cover and heavy-textured, wet, and cold soils (which may be the case in many fields this spring). Therefore, and especially with the currently high fertilizer prices, you could save considerable input costs and application complications by not applying any P or K this spring to high-testing soils except for starter in some situations.

If soil tests are in the Very Low or Low categories, you should definitely apply needed P and K. The potential yield loss from not making these applications for these two soil-test categories is large and the likelihood of yield increase is very high. The probability of large economic return to investment in fertilizer is large because crop prices are high, despite the high prevailing fertilizer prices. Therefore, a few days delay in planting in order to apply fertilizer is warranted. Applying a common starter rate for corn, especially the usually low rates placed in the seed furrow, will seldom result in the same yield response as from applying the full recommended nutrient amount in these test categories. Broadcast, band, or injected P or K after crop planting is not a recommended practice as a rescue application.

When most of a field tests in the Optimum soil-test category there is no single best option as to apply or not apply P and K fertilizer this spring. Recommended P and K rates in publication PM 1688 are provided to maintain soil-test levels in this category, and because the application reduces the risk of yield loss due to nutrient deficiency and is a profitable practice in the long term. However, Iowa research shows that the probability of a yield increase is 25 percent or less in this category and, furthermore, application rates lower than the maintenance rates often result in the same yield response from one crop. Therefore, if your corn planter is equipped to apply

starter (for application in furrow or 2 inches beside and below the seed) you can skip a broadcast application this spring. You should resume maintenance fertilization next fall. Soil-test values will not decrease much due to this year's crop harvest, with research on average indicating a decrease of 1 to 2 ppm for P and 2 to 5 ppm for K. It would be wise to test your soil again in the fall.

For more information see ISU Extension publication PM 1688, *A General Guide for Crop Nutrient and Limestone Recommendations in Iowa*, the article "How do uncertain prices influence phosphorus and potassium fertilization this fall?" in The Integrated Crop Management Newsletter IC-498(24), or the Iowa State University Soil Fertility web page at http://www.agronext.iastate.edu/soilfertility/.