

Defining “High P” Soils in Delaware

Phosphorus (P) is an essential nutrient for optimum plant growth. However, continued application of manures and fertilizers to soils has led to an accumulation of P in many Delaware soils to levels well above those needed for optimum crop growth. In Delaware, soil test P is considered to be above the agronomic optimum (also classified as excessive) when they exceed 100 FIV (equivalent to 100 ppm or 300 lb/acre Mehlich 3 P). Scientific evidence suggests that when soil P levels increase, the risk of P losses from the field also increases. When P is lost from soils, it can end up in surface water bodies (streams, lakes, bays, etc.) and lead to biological and ecological problems.

The Delaware Nutrient Management Act, which was passed in 1999, requires most individuals who raise crops or livestock or who apply nutrients to land to become nutrient management certified. This law also requires individuals who apply nutrients to land to develop a nutrient management plan. A critical step in the development of a Delaware nutrient management plan is determining if there are any fields that have soils “high” in P. The Delaware Nutrient Management Commission (DNMC) legally defines a high P soil as any soil with a soil test value greater than 150 FIV. Therefore, this legal definition of “high” P soils is different than the agronomic interpretation of high or excessive soil test P (>100 FIV).

According to Delaware law, applications of P to “high” P soils cannot exceed a three-year crop removal rate. This statement is critical to any producer who usually applies animal manures at rates needed to meet the nitrogen (N) requirements of the crop. For example, when poultry litter is applied to meet the N demands of corn, the amount of P that is being applied is typically about 1.5 to 2 times more than the crop will need. This restriction of applying only a three-year crop removal rate on “high” P soils should have no impact on producers who use fertilizer to meet the P demands of their crops, because these producers would not typically apply more fertilizer P than required to meet the P demands of the crop.

The DNMC has adopted the P Site Index as a best management practice. Therefore, growers with “high” P soils also have the option of conducting a P Site Index to determine if other P management strategies (i.e., N-based management during one or more years of a crop rotation) are permitted. The P Site Index is a tool that can be used determine the relative risk of P loss from soils to water. It is possible that a field could have a soil test P level greater than 150 FIV but have a P Site Index rating that shows a “low” risk of P loss from the soil. Given this situation, the crop producer would be allowed to apply manure at an N crop removal rate, instead of the P crop removal rate. Practitioners of the P Site Index are strongly encouraged to review the *Technical Guidance Manuals for the Phosphorus Site Index* for detailed instructions on how to conduct field assessments using the P Site Index.

Revision Date: June 2013

Revised Document Prepared by: A.L. Shober, Department of Plant and Soil Sciences, University of Delaware

Original Document Prepared by: G. Binford and D. Hansen

Reviewed by: Sydney Riggi, Nutrient Management Extension Agent, University of Delaware

<http://extension.udel.edu/factsheets/defining-high-p-soils-in-delaware/>