



A & L Great Lakes Laboratories, Inc.

Quality Analyses for Informed Decisions®

News Report

Methods for Determining Soil Phosphorus

Phosphorus (P) is a key nutrient for crop production, and keeping adequate levels of P in the soil is important for maximizing plant growth and development. However, understanding the various analytical methods for determining soil phosphorus can be challenging.

The greatest confusion often lies in understanding why there are different analytical methods for determining soil P. The key to understanding this is to differentiate between total, available, and extractable levels of a soil nutrient.

Total P is the total amount of phosphorus in the soil. This can be P contained in organic materials, P in soil solution, exchangeable P, and P contained in insoluble mineral forms, and can be quite high in many soils. This information generally has limited agronomic use, however, because the amount of P that is actually plant

available is generally only a small amount of the total P in the soil.

Of much greater benefit from an agricultural perspective is what is referred to as extractable P. Extractable P is the amount of phosphorus that can be extracted, or removed, from the soil by using one of a number of different types of chemical extractants. These extractants have been developed to remove certain forms of P from the soil, and this can be a more accurate index of what might be actually available to a growing crop. The ultimate goal of an extractant is to reliably and consistently determine levels of the nutrient that correlate with the amount of that nutrient that might be available to a growing plant.

Bray-Kurtz P1 (Bray P1) has long been utilized in the Great Lakes region as the “standard” P extractant. It was developed in 1945 at the University of Illinois to correlate with the plant-available P fraction of

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Introducing Our Redesigned Newsletter

In order to provide more timely and relevant information to our customers, we will now be delivering our newsletter 4 times per year! We will also employ an electronic delivery format, reducing waste as well as the amount of paper that you need to deal with. If you prefer a hardcopy format, please contact the lab.



Turning a Page... Changes to our Environmental Lab

In November 2011, A&L Great Lakes Laboratories sold all of the environmental division equipment and supplies to Sherry Laboratories, Inc., and most of the A&L environmental employees joined the Sherry laboratory team. While change is never easy, this decision has allowed the A&L Great Lakes team to refocus our attention on our Agricultural testing business.

With the sale of the environmental testing division, the agricultural lab has gained some much needed space. We are discussing how to utilize the extra room, and are evaluating increasing soil drying capacity and storage, soil and plant tissue preparation expansion, moving equipment to improve efficiencies, and adding automation to several of our processes / procedures. The agricultural team has identified improvements, and we are in the process of modifying our laboratory to incorporate these changes.

The additional room will allow us to increase our daily

soil volume, handle incoming samples more efficiently, and process more plant tissues, manures and composts, while still continuing our unwavering commitment to quality. We have

placed orders for two additional nitrogen analyzers, which will be installed prior to the 2012 plant tissue season. We plan to have our first organic matter robot operational before the fall soil season. We are continually looking for areas of improvement in our laboratory operations and our customer service.

We are looking forward to the future, with a new commitment to providing our clients with *Quality Analyses for Informed Decisions*®.



Fall 2011—Soil, soil everywhere!

The Fall of 2011 was a busy one for us here at the lab. With strong commodity prices and high fertilizer costs, growers were concerned about ensuring that they were getting the most from their fertilizer dollar while not limiting productivity or creating environmental concerns from excess nutrient application. All of these factors helped us to have one of the best fall seasons in the history of our company.

The season did present some unique challenges, however. With a wet growing season common over much of the area, harvest and fall field operations were delayed, and the continued wet weather throughout the fall limited the amount of time available to collect soil samples. In addition, the samples coming into the lab were quite wet, requiring extra effort to prepare the samples for analysis.

While overall the season went smoothly, we did identify several areas for improvement, such as in our package handling procedures. We are constantly evaluating our processes and procedures to look for areas in which we can improve our speed and efficiency, and we will be working to make these changes before next fall is upon us.



Our soil sample layout team hard at work



Methods for Determining Soil Phosphorus *(continued from p. 1)*

the soil in slightly acid soils. Many of the P recommendation models, including the *Tri State Fertilizer Recommendations for Corn, Soybeans, Wheat, and Alfalfa*, still utilize Bray P1 soil test values in their equations due to the widespread use of the extractant when these models were developed.

Bray P2, or strong Bray, is a more acidic solution that extracts forms of P that are less soluble than those extracted by the Bray P1 method. This extractant was commonly used when rock phosphate was the major P fertilizer product used in agriculture. It is still utilized by many to measure less soluble forms of P, what is commonly referred to as “active reserve” P in the soil, although most P recommendation models do not consider Bray P2.


Olsen P, or bicarbonate P, is a procedure that was developed in the 1950’s for determining P levels in neutral to alkaline soils. These soils are more commonly found in areas west of the Great Lakes region, so this test is only performed by request.

Mehlich-3 is the most commonly used extractant currently employed by soil testing laboratories in the region. It is a relatively safe extractant to work with and can be used to determine levels of other nutrients in addition to P, which makes it a more efficient method than others. Mehlich-3 is effective on the same types of soils as the Bray P1, but Mehlich-3 soil test P values are somewhat higher than those obtained by a Bray P1 extraction. However, the Mehlich-3 values correlate well with Bray P1 values, so



Mehlich-3 values can be regressed into a Bray P1 equivalent number by using a mathematical operation. This allows soil test P values to be reported as a Bray P1 equivalent, which is necessary for making P fertilizer recommendations.

For any type of laboratory analysis to be useful, interpretations must exist in order for the data to be utilized to make decisions on a field scale. While different extracts have been developed to target different forms of P in the soil that may be plant available, this does not mean that the values determined by an extraction are absolute quantities of that nutrient in the soil. Much research has been done to correlate these soil test levels with crop response to a fertilizer material, and it is that correlation that is necessary for interpreting this information and making decisions.



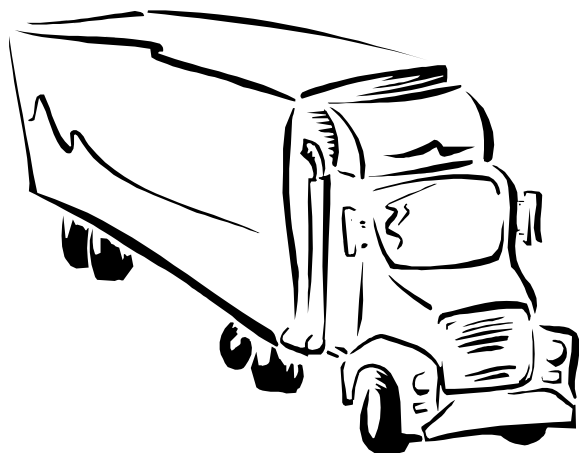
Tools available on www.algreatlakes.com

- eDocs - Online document and data management and storage
- Sampling Guides
- Online Supply Ordering
- Submittal Forms
- Soil Test Summaries
- Fact Sheets - Concise and practical Information
- and much, much more!!!

New Sample Shipping Option Available

This is to fully introduce a new sample shipping program that A & L Great Lakes Laboratories, Inc. began offering to our clients last fall. The Return Service (RS) program, offered through United Parcel Service (UPS) is a convenient way to ship samples to the laboratory for analysis. This program is similar to the Authorized Return Service (ARS) program that we have offered in the past. However, the RS program has a number of advantages over the ARS program.

The cost for shipping samples with the RS program is based on the weight of the package to be shipped. This results in more accurate shipping rates and, coupled with the significant discount associated with this program, will generally be a more economical way to ship samples as compared with the ARS program. Shipping charges will be applied to your A & L account and, as with the ARS program, are not applied until after the package is received at the laboratory.



The RS program also allows packages to be tracked through the UPS Quantum View[®] system. This system is set up to provide the client with an email notification when the package arrives at the laboratory, providing a more timely notice when your samples arrive and reducing some of the uncertainty associated with sample shipment. In addition, the Quantum View[®] system also notifies the client if there is any deviation in the normal processing of the shipment, alerting you in advance of any possible delays. These features help to keep you better informed about the status of your samples.

RS labels can be ordered via our online store or by contacting the laboratory at 260-483-4759. When labels are ordered, you will be asked what types of samples you will be sending, as well as the approximate weight of the package being shipped. This information will be used to generate labels that are appropriate for the package to be shipped. The labels also contain all of the necessary client information for the package to be shipped, so no additional information needs to be entered on the label.

To ship samples to the laboratory, simply affix the RS label to the package to be shipped and send the package from a UPS shipping location. Package pickup may also be available for an additional fee. Contact your local UPS representative for more information on package pickup.

Please refer to the attached information sheet for more information about the RS program. If you have any questions, please contact the lab at 260-483-4759, or by email at lab@algreatlakes.com.



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