NEWS REPORT
A & L GREAT LAKES LABORATORIES, INC. SPRING 2002

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Pesticide Residues:
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Fertilizer Analysis:
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Compost Analysis:
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Quality Control Approach – Soil Testing

Contrary to the thinking of many people, quality control in a laboratory doesn't just "happen." All the control charts and best instrumentation in the world do not make up for a poorly trained operator. Likewise, the most proficient chemist with the best method will not produce good data if the instrument is not properly maintained and calibrated. When dealing with laboratory quality, there are many variables that must be properly managed.

A laboratory may be reactive in nature. This means that they look internally or take action only when their results are questioned or challenged. This creates a defensive mindset and leads to confrontations, mistrust and wasted time spent justifying reported results. Being proactive requires a lab to intentionally devote resources to understand the customer's requirements; standardize procedures; train and educate all analysts; effectively evaluate and document the precision, accuracy and control of the measurement system; monitor progress and make changes when necessary. Proactive labs such as A & L Great Lakes are constantly looking for ways to improve quality control measurements. *-continued on page 4*

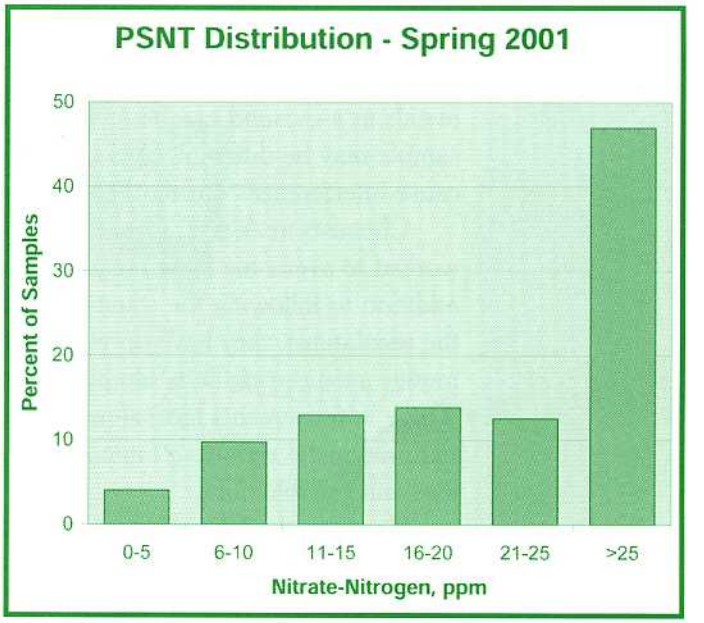
PSNT for Corn Nitrogen Management

Use of the pre-sidedress nitrogen test (PSNT) is increasing because it is a reasonably successful nitrogen management tool for corn. Higher N fertilizer prices and increased environmental awareness have stimulated interest in the PSNT in recent years.

We summarized the PSNT results of samples analyzed in May and June of 2001 (see accompanying chart). Almost 50% of the samples had nitrate-nitrogen concentrations greater than 25 ppm. According to University guidelines, no additional N fertilizer would be required for the corn in the fields these samples represent.

We don't know the N management background of these PSNT soil samples (N rate, time of application, manure, etc.), so all we can do is broadly summarize this information. However, customers routinely using the PSNT indicate that it helps them fine-tune their N fertilizer program.

Contact us for a copy of the A & L Great Lakes Fact Sheet titled ***In Season Soil Nitrate Testing for Corn***, which provides sampling guidelines and test interpretations.



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Meet Greg Neyman

Greg Neyman is A & L Great Lakes Laboratories' Coordinator of Quality and Information Systems. Greg is responsible for A & L's quality assurance program, especially as it relates to Good Laboratory Practices (GLP). He is our safety officer, provides technical support for computer hardware and software problems, and network issues. Greg is responsible for our web site maintenance, responds to questions about our SoilTrak software, and keeps our LIMS network virus free.

Greg joined the A & L Team soon after he graduated from Anderson College, Anderson, IN with a BS in chemistry. He found his special QC niche when the laboratory started analyzing samples under GLP, and was promoted to Quality Assurance Coordinator. Greg is currently putting the final touches on his Masters thesis in Quality Assurance.

Greg and his wife Lisa have two children, Alexis (5) and Gavin (3). In Greg's spare time he enjoys playing league softball, bike riding and spending time with his family.

Biosolid Analysis Standards

In 1993, the U.S. Environmental Protection Agency (EPA) established the federal regulations for the use and disposal of biosolids (the residual material created by the biological treatment of wastewater). This rule is the "bible" for land application of biosolids, but also specifies the laboratory analysis methods and reporting limits that must be used.

These federal regulations (CFR 40 Part 503) established ceilings (concentration limits) of pollutants (primarily metals) allowed in land-applied biosolids. Each metal in biosolids is limited in land application by the (1) maximum allowable concentration in the material, (2) maximum annual application rate, and (3) cumulative lifetime application limit to the application site.

Laboratory analysis of metals in biosolids brings additional challenges. Biosolids are a complex organic material that can vary with the unique processes of each wastewater treatment plant. Determining trace levels of metals in a biosolid can be a challenging procedure. Each sample may be different in its composition, which can cause interferences during the analysis.

Chemists at A & L Great Lakes Laboratories have worked to overcome these metals analysis challenges. In addition to following the standard methods specified in the regulations, they have developed specialized techniques used during both sample preparation and analysis. These improvements have allowed A & L to meet the required metal reporting limits, while producing consistent and reliable data.

Consistently delivering quality data on a timely basis is the goal for each sample we receive. For additional information on metal detection limits or quality control procedures, please contact Keith Henley.

Manure Analysis – *CFO Update*

The State of Indiana recently passed its ruling on Confined Feeding Operations (CFO). These regulations go into effect on March 1, 2002, for Indiana livestock producers. Other states in the Midwest are either developing or have already enacted their CFO regulations.

Most state CFO rulings require a manure analysis be obtained to determine the amount of nutrients being applied to the soil. We recommend testing manure at least for Total and Ammonium Nitrogen, Phosphorus, and Potassium (our M4 manure test package). This provides the information needed for both nitrogen- and phosphorus-based nutrient management plans. A basic soil analysis is also required to determine present soil nutrient levels.

Many CFOs have already met the manure and soil testing requirements. However, for those that have not, A & L routinely analyzes and reports both soil and manure samples within three business days. Our reports are easy to understand and provide the information needed to complete your CFO forms.

Sample containers and submittal forms are available to help with the process. General soil and manure sampling guidelines are also available. Please contact us for more information.

Diagnosing Apparent Nutrient Deficiencies

Diagnosis of crop growth problems is always a challenge. Is poor plant color in an area of a field solely a nutrient problem, or is it caused by a combination of weather, compaction, and management factors? If it were easy, you wouldn't have been asked to diagnose the problem and suggest a possible remedy.

Researchers at the University of Minnesota suggest a strategy of taking soil samples in three areas of a problem field: where the crop is growing well, where crop growth is most affected, and from an area where symptoms are just starting to appear. We also suggest taking a plant sample for nutrient analysis from each of these areas.

Comparison of these paired soil and plant analyses should give a much clearer picture of the problem:

1. Check the soil analysis report for low nutrient levels and other factors. Uniformly good soil test levels across these areas would indicate it is not a soil fertility problem.

2. When a plant analysis report indicates a deficiency, check the corresponding soil test results for a low level of that nutrient or soil pH, which can affect nutrient availability. If the plant analysis indicates a deficiency and the soil test is adequate, other environmental and management factors are likely affecting nutrient uptake.

3. When both the soil and plant analysis reports indicate adequate nutrient levels, you move on to other possible causes for the symptoms.

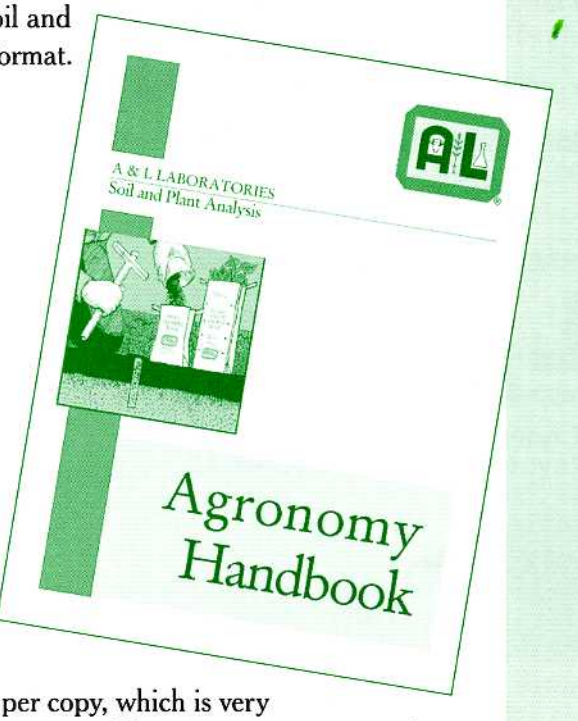
This stepwise approach provides the information usually needed to determine the cause of an apparent nutrient deficiency. Contact us for further information on soil sampling and plant sampling techniques.

Agronomy Handbook Updated

Our ***A & L Agronomy Handbook*** is one of the best soil and plant analysis resource materials available. This fact-filled handbook has been updated with a new format that makes it more readable and easier to find information. A limited amount of new information has also been added to the handbook.

The focus of the ***A & L Agronomy Handbook*** is to outline soil and plant nutrition basics of production agriculture in an easily useable format. Major sections in the handbook include:

- **General Properties of Soils**
- **Soil Management**
- **Nitrogen**
- **Phosphorus**
- **Sulfur**
- **Cation Exchange Capacity**
- **Soil Reaction (pH)**
- **Micronutrients**
- **Fertilizer Timing and Application**
- **Soil Sampling**
- **Plant Analysis**
- **Diagnosis and Corrective Measures**



Additionally, over 30 tables provide easy access to a wide range of information (fertilizer properties, crop nutrient removal, plant tissue sufficiency guidelines, etc.).

The cost of our ***A & L Agronomy Handbook*** is only $12.00 per copy, which is very reasonable for the amount of information that you will have at your fingertips. Please contact us to purchase a copy for yourself (and others).

Quality Control Approach – Soil Testing *-continued from page 1*

A & L Great Lakes uses standardized Quality Control procedures to monitor the internal quality control of laboratory data. Our internal quality control procedures include using instrument control, laboratory sample control, duplicate, blank, and blind control samples. Instrument and laboratory control samples are both run at a frequency of at least 1 per 25 customer soil samples. Other types of quality control samples are included at intervals needed to assure proper monitoring.

External quality control tools complement the data provided by the internal QC. We participate in several external proficiency testing programs for agricultural soil analysis. Among those are the:

- North American Proficiency Testing Program (NAPT) – Quarterly proficiency testing program involving over 150 labs around North America. Overseen by the Soil Science Society of America.
- ISTA Soil Testing Proficiency Program – Quarterly soil sample analysis exchange program offered to members of the Illinois Soil Testing Association.
- State Soil Test Programs - Agricultural Conservation Program (ACP) involves testing for pH, buffer pH, phosphorus and potassium with certification issued by individual state Farm Service Agency (FSA).
- Wisconsin FSA Certification Program – Wisconsin requires that soil samples from fields receiving cost-share funds for nutrient management be analyzed by Wisconsin-approved soil test methods. Proficiency samples are analyzed 8 times per year.
- A & L Laboratories Quality Control Exchange - Soil samples are exchanged monthly among the A & L Labs in North America.

At A & L Great Lakes Laboratories we take pride in the quality of the results we report to our customers. We realize that our reputation depends largely on the quality of the data produced. Our implementation of many different quality tools helps ensure the level of quality our customers expect. Our goal, supported by our company philosophy of continuous improvement, is for A & L Great Lakes to be recognized as the quality leader of the soil testing industry.

We are not satisfied to rest on our past accomplishments. We are constantly evaluating our soil testing process, and investigating ways to improve and become more efficient so that our customers not only receive quality results, but also receive them at a competitive price.

260 Area Code Change

Our telephone area code is now 260. The previous area code (219) will only work through mid-June of 2002.

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