

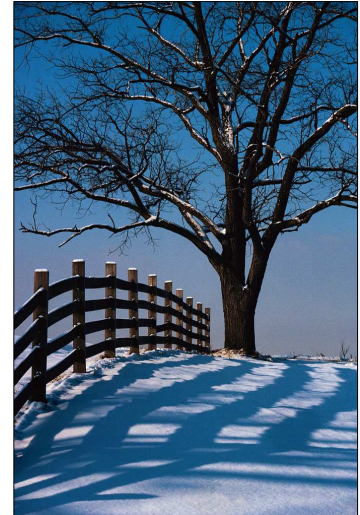
# Agri *focus*

LABORATORY SOLUTIONS FOR THE MODERN WORLD.

## MESSAGE FROM THE PRESIDENT

Dear Reader,

Here at Agri Analysis Inc, we can think of no better industry to be a part of than the agricultural sector. We are humbled by the resilience shown by our farmers, producers, and growers given the extreme weather conditions these past 12 months. As another year ends we all have much to be thankful for! As I look around our world and in every sector of our country, I see fundamental economic change, governments that at its very best cannot meet on common ground, and problems that are so complex they will take what seems to be a lifetime to correct. Given the magnitude of these problems, agriculture reminds me of the North Star: unwavering, a constant, and faithful.



At Agri Analysis, we have once again made great progress throughout 2011! We have successfully implemented a pH semi-auto system, which has resulted in more efficient turn-around time for our soil analysis customers. Continued web-site improvements will allow our customers to change crop and yield goals and receive fertilizer recommendations for multiple crops with a couple of clicks of a computer mouse. Promoting and delivering factual information in a user friendly way continues to be a responsibility and a privilege of our laboratory.

With that in mind, there are some exciting changes coming to the laboratory in 2012. We have partnered with a local dairy farm in order to harvest rumen fluid. This will further our study of starch digestibility in forage. We'll be purchasing an additional muffle furnace that will speed up turn-around time in the agronomy laboratory. The accreditation and certification in many proficiency programs remains our top priority, ensuring results from our laboratory are of the highest standard and quality. Water quality is also important! In 2012, Agri Analysis plans to become a PA DEP certified laboratory. We will continue to schedule meetings between lab staff, management, sales and ownership to get everyone involved in these processes.

It continues to be our hope and desire that this newsletter addresses topics that are informative to you, as well as educational. Please continue to let us know topics you would be interested in learning about!

As this year draws to a close, there is no better time to thank each of you for your business and your support. We realize you have more choices than ever before and appreciate your loyalty. All of us at Agri Analysis would like to wish you and your loved ones a very safe and joyous Holiday Season. We look forward to working together in 2011 to create a new year filled with prosperity, hope and happiness.



**Happy Holidays!**

*George Mitchell  
Agronomist & President*



## DEPARTMENT SPOTLIGHT: Nitrogen and Potassium Leaching Due to Excessive Rainfall Amounts

George Mitchell, President / Agronomist

The fall of 2011 has come and gone! Many fertilizer companies have completed their soil testing for the year and are now putting together fertilizer programs for the farmer or producer. During the fall months, we received a number of questions regarding the leaching of plant nutrients due to excessive rainfall. In particular, the prominent plant nutrients in question were nitrogen and potassium.

Weather conditions were nothing short of extreme this year, with many experiencing devastating effects on their crops. Here in eastern Pennsylvania, we received upwards to 70 inches of rain. While we are sure that there have been reports of higher amounts of rainfall, it is safe to say that this was truly a phenomenon we hope to never see repeated.



The leaching of plant nutrients is one of the many problems that results from excessive rainfall.

### **Nitrogen**

Rain water, in excess of what can be held by the soil, leaches down through the soil profile. It carries with it nitrate nitrogen. Nitrate nitrogen leaches easily because it is very water soluble and is negatively charged. Thus, it is not held by the negatively charged particles commonly referred to as the Cation Exchange Capacity (C.E.C.) of the soil. Ammonium (such as urea), on the other hand, is positively charged. As a result, it is held by these soil particles and is not readily leached.

### **Potassium**

Potassium, or as I like to call it “the floating mineral,” is very dynamic. There are approximately 24,000 pounds of potassium per acre in most agriculture soils under production. With such a large concentration of potassium in the soil, you may wonder why so little is accounted for when viewing a soil analysis report. To understand this, let’s take a look at the 4 major sources, or cycles, of potassium:

1. *Potassium as a Mineral:* Examples of potassium as a mineral include feldspar or mica. The transfer to other states occurs very slowly. Thus, in a mineral state it is not considered available during a growing season.
2. *Fixed Potassium:* Potassium can be captured by the soil structure of expanding clay. The clay structure of soil often has a horizontal or layering effect. Potassium can become fixed by attaching itself between each layer of clay. This is especially evident when compaction occurs.
3. *Exchangeable Potassium:* Potassium “holds onto” the C.E.C. of the soil. Potassium is in equilibrium with the soil solution and thus, rapidly replenishes the soil solution with more potassium as potassium is removed. The bottom line here is that excessive rainfall will create an imbalance to this equilibrium, resulting in an excess of potassium in soil solution.
4. *Potassium in the Soil Solution:* This represents that fraction of potassium that is readily available to the plant root systems.

Whether your tillage system is conventional, minimum or no-till, plant nutrients will leach if excessive rainfall or irrigation occurs. If you are seeing depressed nutrient levels on your soil report, reported as either pounds per acre or ppm, resulting in a lower soil saturation, contact an agronomist or nutrient management consultant for their assistance in an effective soil management plan moving forward.

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## CROP SPOTLIGHT

### Presence of Vomitoxin (DON) in Corn



Keri Foster, Sales Representative



Gibberella Ear Rot, shown above, often produces vomitoxin and other toxins, such as zearalenone. High moisture conditions favor growth of many ear and stalk rot fungi. Fields should be scouted as soon as possible to determine the extent of disease problems.<sup>2</sup>

Two years ago, an overly wet summer and fall raised some concerns regarding the possibility of high levels of vomitoxin in the 2009 fall corn crop. Vomitoxin is caused by a fungal disease that sprouts up in overly wet conditions. The toxin can sicken livestock if consumed in high concentrations. The U.S. food and Drug Administration allows vomitoxin concentrations of no more than 5 parts per million in feed for swine, and 10 ppm for cattle and poultry feed.<sup>1</sup>

#### 2009 Recap

In the summer of 2009, we saw the presence of vomitoxin (DON) in small grain crops. This led to speculation about the 2009 fall corn crops. At the time of the 2009 winter newsletter, we saw the number of positive tests for DON in corn samples double from 2008. Additionally, the concentration of toxins had been higher. That year, the average concentration of mycotoxins in a positive test had been 2.7ppm. In 2008, the average concentration was 0.7 ppm. Often, the positive tests for DON are compounded by a positive test for another toxin. Other toxins that had been present in 2009 include zearalenon and 15-acetyldoxnivalenol.

#### 2011 Corn Crop

Similar to 2009, we have experienced a very wet 2011 growing season. We were interested in not only looking at the presence of mycotoxins between 2009 and 2011, but also comparing those levels to the 2010 season in between.

**Table 1:** The presence of DON in August – November corn silage samples in 2010 compared to 2011.

	# of Samples Tested	Samples positive for DON / %*	Samples between .5 ppm – 1.0ppm / %*	Samples Between 1 ppm – 5 ppm / %*	Samples Between 5ppm – 15ppm / %*	Avg DON Concentration
<b>2010</b>	19	14 / 74%	1 / 5%	12 / 63%	1 / 5%	1.68ppm
<b>2011</b>	25	18 / 72%	4 / 16%	9 / 36%	6 / 24%	3.54ppm

\* % of total samples tested that year

While the percentage of samples testing positively for DON does not appear to have increased since 2010, the average concentration of DON in the samples analyzed has certainly increased. In 2010, only one of the samples tested positively for DON at a concentration the FDA considers unsafe for swine (greater than 5ppm). In 2011, 6 out of the 25 samples showed concentration levels considered unsafe for swine. Out of those 6 samples, 4 had a DON concentration greater than 10ppm, the level at which the FDA considers unsafe for cattle and poultry.

Agri Analysis Inc offers extensive toxin evaluation services. Our MT6 package includes Aflatoxin B1 B2 G1G2 by HPLC, Deoxynivalenol (DON) or Vomitoxin, 3 Acetyl DON, 15 Acetyl DON by HPLC, T-2 Toxin by TLC and confirmed by GC, Zearalenone by TLC and confirmed by HPLC for \$77.50.

#### References:

<sup>1</sup>Plume, Karl. *ADM says vomitoxin in US corn "not a big deal"*. Reuters Online. 19 November 2009. <http://www.reuters.com/article/marketsNews/idUSN1919324020091119>.

<sup>2</sup>Robertson, Allison. *Corn Quality Issues in 2008 – Field Molds*. Iowa State University. 24 October 2008. <http://www.extension.iastate.edu/CropNews/2008/1023hurburghrobertsonelmore2.htm>



## TECHNOLOGY SPOTLIGHT

# The State of the Economy and Your Testing Laboratory: Are we better off than we were a year ago?



Jeff Foster, CFO / Owner

Towards the end of November 2011, the S&P 500 index is up 1.6% from a year ago, 9.5% from two years ago, and 41.5% from three years ago (based on the 11/25/11 close of 1215.65). The S&P 500 earnings estimate for 2011 will be up 14.8% from 2010, and up 58.3% from 2009. The US economy in the third quarter of 2011 grew 1.6% from the third quarter of 2010, and is up 5.2% from the third quarter of 2009. The unemployment rate in October 2011 was 9.0%, down from 9.7% in October 2010 and 10.1% in October 2009.

Here at Agri Analysis Inc, we are fortunate to be well diversified. We offer testing services across many agricultural fronts. Our Forage, Feed, Soil, Plant Tissue, Water and Nutrient management departments are doing well. Based on the economic challenges and our customer desires, I believe we have made the necessary operating plan adjustments to continue to provide high quality results in a timely manner.



The wet chemistry laboratory at Agri Analysis Inc

Today we are proud of our 2011 accomplishments! Many of our process improvements will help us control cost and offset our suppliers' inflationary price increases. In the area of facility maintenance, we upgraded our roof ridge vent, improved our chemical storage, we purchased four new computers and the latest version of our accounting system. As far as laboratory equipment, we installed an off hours control system to our digestion system for mineral analysis, we purchased a new electronic shaker for Water Extractable Phosphorus (WEP) manure analysis and installed a new automated soil pH meter!

Additionally, we implemented new test packages to our customers. They include NIR Starch Digestibility, NIR soybean and soybean meal analysis, Wet Chemistry Starch %, Fat % using the Acid Hydrolysis method, and Bicarbonate and Sodium Adsorption Ratio (SAR) on Soilless Media. We also enhanced our web site to include a SQL database for customer reporting.

While many are still feeling the impact of the rough economy over the past few years, economic conditions have improved. Over the past year, your testing laboratory has successfully implemented facility upgrades, purchased and installed new equipment and is offering new analytical services. We value you as our customer and we look forward to 2012 to continue to make improvements to ensure we maintain our long-term quality partnership.

As always, thank you for your business!



### What's New:

NICO 2000 10 Channel pH Semi-Automatic Soil pH System has been installed and is now operational!

With the elimination of manual entry and a processing time reduction by 50% customers will see expedited laboratory turn-around of soil analysis reports. Your customer service experience with us is our top priority.