

**SERA-IEG-6 2011 ANNUAL MEETING**  
**Agronomic Division - N C Dept. of Agriculture and Consumer Services**  
**Raleigh, NC**

**June 19-21, 2011**

**AGENDA**

**The 2011 participant list is posted to the website.**

**Sunday, June 19**

6:30-9:00PM                      Evening meeting at the JC Raulston Arboretum

6:30-6:40PM                      WELCOME AND INTRODUCTIONS

6:45-7:15PM                      SPONSOR PRESENTATIONS

**Timberline Instruments-** Sara Bury: Boulder, CO: Ammonia/Nitrate Analyzers, targeted to agricultural markets. Specific to ammonium ion. Single channel systems measure for ammonia then nitrate, the dual channel model samples for each simultaneously. Windows 7 software, multipoint calibrations, several options for data saving. Currently in the final stages of the review process for EPA approval that involved 10 laboratories cooperating in the work.

**Labfit-** Matthew Prentice: Water dispenser, AS 3000 software and controller upgrades – 2.3 times faster.

**STATE REPORTS**

**Alabama:** The total number of routine soil samples is about 4000 more than 2010 at this time. Our non-routine soil, plant and water analysis is about the same as last year this time. Our forage analysis is much lower what it was the last two years.

Our payments, report delivery options, lime and fertilizer calculators have been online and updated frequently.

There is no personnel change at our lab, but temporary workers have been replaced by student workers.

Our vario MACRO CHN analyzer from Elementar doing fine, but consumes more consumables that are expensive.

We will be including CEC and micronutrients in our routine reports in the near future.

We are working on modifying our routine reports to include our updates.

We conducted a very successful Soil Testing Advisory Committee meeting on April 19, 2011, with the presence of the Dean of the College of Agriculture, Dr. William Batchelor. Different departments, extension, agricultural research experiment station and producer representatives were present. Dr. David Kissel, director of UGA agricultural services labs and SERA-IEG 6 administrator attended the meeting and made presentation on SERA-6 white paper, Public Agricultural Services/Soil Testing Laboratories: Their Value and Contributions in the Land Grant University. He adequately explained the importance and tradition of university associated public and how their mission is an integral part of the Land Grant universities. His presence was well received and appreciated by the audience. Dr. Charles Mitchell made a presentation on current updates on Auburn University Soil Test recommendations and reports. The meeting was scheduled for an hour and half, but it lasted three hours. There were many questions, comments and discussions pertainin to the services of our lab and its financial status.

**Arkansas:** 2011 State Report for University of Arkansas, Fayetteville Agricultural Diagnostic Service Laboratory and Marianna Soil Test Laboratory, submitted by Nathan Slaton, Nancy Wolf, and Morteza Mozaffari

#### *I. University of Arkansas - Fayetteville Lab*

- a. The Agricultural Diagnostic Laboratory located in Fayetteville, AR performed fee-based elemental analyses on a total of 28,867 samples including 1,357 forage, 285 plant and 174 soil (for diagnosis of nutrient deficiencies and/or toxicities), 1,276 dry- and 212 liquid-manure, 12,738 research plant, 3,166 research soil, and 9,427 prepared special samples during 2010. An additional 177 samples were analyzed for strawberry (177) and orchard (20) nutrient monitoring programs with clients from several states. Samples were submitted by growers, the general public, and researchers from various institutions and industries. Laboratory analysis fees have not been increased since 2005.
- b. Databases of dry and liquid manure chemical properties were updated to included information from 2010 samples. As reported in last year's minutes, the laboratory started analyzing water-extractable P (WEP) in poultry litter (except samples from Eucha Spavinaw watershed) with the 100:1 solution:manure ratio method. A total of 314 litter samples were analyzed with a median of 2935 mg WEP-P/kg, a mean of 2899 mg WEP-P/kg, a standard deviation of 1000 mg WEP-P/kg, and a range 535 to 6576 mg WEP-P/kg. The mean WEP represented 23.7% of the manure total P. Information on poultry litter WEP has been shared with the Arkansas Natural Resources Commission (ANRC) for a reference of mean values for nutrient management planning.
- c. In 2010, the Fayetteville lab participated in the Analytical Laboratory Proficiency (ALP) Program, but has returned to the NAPT program in 2010. The Diagnostic Laboratory also maintained certification by the National Forage Testing Association Certification Program and the Manure Analysis Program.

#### *II. University of Arkansas - Marianna Lab*

- a. For the 4th consecutive year the Marianna Soil Test Laboratory analyzed a record number of soil samples. The total number of soil samples analyzed in 2010 was 155,436. Of this total, 142,483 were samples submitted by clientele and the remaining 12,953 samples were standard check soils analyzed for quality assurance. The number of grid soil samples analyzed in 2010 was 84,763, which is approximately 59.5% of all samples received. Grid soil samples have increased at the rate of 17,351 soil samples per year since 2006, whereas the number of 'field average' samples has remained relatively constant. The lab received >40,000 client samples during the months of March and October 2010. Sample 'turnaround time' has become an issue during the busiest months and may exceed 4 weeks. The annual summary of soil test results is published in the 2010 WE Sabbe Soil Fertility Research Series Bulletin (<http://arkansasagnews.uark.edu/5992.htm>).
- b. Organic matter analysis by Weight Loss on Ignition was performed on 711 soil samples in 2010.
- c. The Marianna Laboratory continues to participate in the North American Proficiency Testing Program (NAPT) coordinated by the Soil Science Society of America.
- d. A new soil pH robot system was purchased (J-Chem company in St. Louis, MO) and brought online in early June 2010. It replaced a 15-year old system that frequently broke down and ran on the obsolete Windows 98 operating system. The software for the new pH robot is based on Windows XP Operating System. Thus, we were able to install firewall and virus protection programs to increase data security and reduce the downtime. The new pH robot enhanced our ability to increase sample output. It tests four samples at a time and can be upgraded to test 12 samples at a time at a cost of \$6,500.
- e. The Marianna lab currently operates four inductively coupled plasma (ICP) units. The four units were purchased and operational in 1991, 1997, 2006, and 2010. We purchased a new Spectro-ARCOS 160 model ICP as a replacement for an older ICP (purchased in 1998), which had a history of frequent problems. The new ICP arrived in early March 2010 and was brought online in June of 2010. The ICP bought in 1991 is obsolete and spare parts are no longer readily available. Another ARCOS 160 ICP has been purchased to replace the obsolete 1991 model and should be installed before the fall 2011 season.

**Florida:** Slight increase in Extension, large decrease in research samples. About 5% increase of soil test Extension. About 14% increase in livestock Extension samples. Down 35% in certified analysis in research. New ICP new month. New C:N analyzer. Trying to replace Adams-Evans buffer.

**Georgia:** Agricultural and Environmental Services Laboratories (Soil, Plant, and Water Laboratory; Feeds and Environmental Laboratory; Pesticide and Hazardous Waste Laboratory; Trace Analysis Laboratory)

Report prepared by: Leticia Sonon, Uttam Saha, Jake Mowrer, Angie McGarvey, Rick Hitchcock, David Kissel

Sample Numbers: The total number of samples received at the Agricultural and Environmental Services Laboratories (AESL) of the University of Georgia increased by about .6% relative to last year's submission. Soil samples showed a 10% increase in the current year. The breakdown of these samples is shown in the table below.

Sample Type	May 2009 - April 2010	May 2010 - April 2011	Difference
Soils	71961	79251	+ 7290
Manures	2412	2594	+ 182
Waters	6999	6442	- 557
Plants	5118	4869	- 249
Feed and Forages	2770	2557	- 213
Microbiology	1597	1665	+ 68
Georgia EPD contract	824	169	- 655
Other	1547	1324	- 223
<b>TOTAL</b>	<b>93228</b>	<b>98871</b>	<b>+ 5643</b>

**Descriptions of entries:**

- **Soils:** Samples from the Soil, Research Soil, Greenhouse, and Total Soil tables; Specials with the word "soil" somewhere in the sample type (i.e., "Soil Extract"); and PHW samples labeled "Soil."
- **Manures:** The Animal Waste tables; plus Specials with the word "litter," "lagoon," or "manure" in the sample type.
- **Waters:** The Water and Wastewater tables; Specials with the word "water" in the sample type; and PHW samples labeled "H2O."  
Note that wastewaters are included beginning FY10 only.
- **Plants:** The Plant tables; Specials with the word "plant" in the sample type; and PHW samples labeled "Foliage."
- **Feed and Forages:** The Feed tables; Specials with the word "feed" in the sample type; and PHW samples labeled "Feed."

- **Microbiology:** The Microbiology tables.
- **Georgia EPD contract:** The EPD table.
- **Other:** The Cotton and Research Cotton tables; plus Specials and PHW samples not included in the above categories.

### New Initiatives:

- a. Work continues on testing of software to calculate the nitrogen mineralization from Winter cover crops. Farmers samples of cover crops were submitted in spring 2011 for evaluation of their N release. NIR spectroscopy is used to provide some inputs for the model. Additional data is being collected to further test the model before it is offered to the public for use, perhaps in 2012.
- b. In Georgia, waters high in uranium and arsenic have recently been detected in some wells. In order to encourage the well owners to have their waters tested for arsenic and uranium, the Agricultural and Environmental Services Laboratories (AESL) of University of Georgia Cooperative Extension offered a reduced price testing program for six months from February/01/2011 to August/01/2011.

### New Instrumentation:

- 1) TL 2800 NH<sub>4</sub>-N and NO<sub>3</sub>-N analyzer from Timberline Instruments, Inc.
- 2) 6400 Oxygen Bomb Calorimeter from Parr Instrument Company
- 3) Elementar Vario Max CNS

### External Audits of Georgia Work

#### **Association of American Feed Control Officials (AAFCO)**

- Feed Check Sample Program

#### **Environmental Resource Associates (ERA)**

- Annual Proficiency Testing
- Proficiency testing for total and fecal coliforms and *Escherichia coli* in water

#### **Minnesota Department of Agriculture Manure Analysis Proficiency (MAP) Program:**

- Semi Annual manure proficiency testing for various analytes

#### **National Forage Testing Association (NFTA):**

- Laboratory certification for testing forage and hays by wet chemistry and Near-Infrared Spectroscopy (NIRS)

#### **Agricultural Laboratory Proficiency Program (ALP):**

- Quarterly proficiency samples of soil, plant, and water

**NSI Solutions, Inc.**

- Annual proficiency check samples for physical, chemical, and microbiological water analyses

**State of Georgia Environmental Protection Division (EPD)**

- Laboratory certification to examine drinking water samples for total and fecal coliforms and *Escherichia coli*

**United States Geological Survey (USGS)**

- Semi-annual interlaboratory comparison of standard reference water samples

***Kentucky:***

1. Greg Schwab (soil fertility specialist at UK in Lexington) accepted a position as Directory of Agronomy at Koch Agronomic Services located in Wichita, Kansas.
2. Edwin Ritchey is a new soil fertility specialist at UK in Princeton. Edwin is filling the void left when Lloyd Murdock moved into his administration position at Princeton.
3. Diane Hunter was hired as the new soil lab supervisor at the laboratory in Lexington.
4. Received a new Elementar C/N/S instrument.
5. Sample numbers for 2010 for both Lexington and Princeton labs: Agriculture: 37,549; Home, lawn and garden: 8,753; Commercial horticulture: 850; Greenhouse media: 79; Research: 7,485; Atrazine: 10; Animal waste: 390; Nutrient solution: 84

***Louisiana:*** The LSU AgCenter Soil Testing and Plant Analysis Laboratory analyzed 13,964 routine soils samples and 5,586 plant samples in 2010, which reflected an increase of 6% and 17%, respectively, from 2009.

The lab changed interpretation of soil test phosphorus directly based on Mehlich 3 and discontinued the use of a regression equation between Bray 2 and Mehlich 3 for interpretation. Also, the lab simplified soil test P interpretation by removing soil texture, soil type (e.g. upland vs. alluvial), and crop differences.

The lab improved the soil sample submittal process for non-traditional clients by providing mail-ready sample boxes.

The lab upgraded the interpretation database for soil testing of home vegetable gardens and improved the reporting sheets.

The lab also simplified the liming interpretation and improved the data reporting for agricultural consultants.

***Mississippi:***

Both soil and plant sample numbers were higher in the last fiscal year. There has been no change in the cost structure. There continues to be significant administrative changes in the laboratory chain of command, with a different department head beginning soon

A Nutrient Management Manual for Agronomic Crops has been prepared, and negotiations are underway with the Mississippi Department of Environmental Quality for them to fund the preparation of a hard copy version. The manual will be posted on MSUcares.com regardless, along with a complete set of new and newly revised associated publications. This manual will have most of the MSU Extension Service fertility recommendations in one place at one time for the first time since 1979. Much of the subject matter was posted to the new Row Crops oriented blog: Mississippi Crop Situation at <http://www.mississippi-crops.com/>.

A radio series on the fundamentals of plant nutrition, including soil testing, was produced in early 2010, and soon will be compiled into a central web location.

<b>Category</b>	<b>Quantity</b>	<b>Percent Change</b>
Soil	23,327	+7.3
Plant	2501	+7.2

**North Carolina:** NCDA&CS Soil Testing Section: The lab analyzed 332,599 soil samples and issued 41,160 reports with fertilizer and/or lime recommendations in FY2010. This workload is about 9% lower than that of FY2009 but workloads over the past several years have been similar. A new Spectro Arcos ICP was placed online in January 2010, replacing one of the original three Thermo 61E instruments. We now have 3 Arcos ICPs and two Thermo 61Es. In December, however, turn-around time slowed to nine weeks due partially to inclement weather and ICP issues.

New crop codes and associated fertility recommendations were implemented this year for plasticulture strawberries, hops and bio-retention cells as related to stormwater issues.

A new LIMS project is still under development for all labs. We hope to have it completed by December, 2011.

Our annual state soil test summary data is available on-line at <http://ncagr.gov/agronomi/stdata2010.htm>.

The Plant/Waste/Solution/Media Section analyzed 9,747 plant tissue samples; 16,941 waste samples; 2,274 solution samples; and 307 soilless media samples in FY2010 (July 1, 2009 through June 20, 2010). It issued a total of 12,261 reports. This workload is about 4% lower than that of FY2009.

It is interesting to note the change in the types of crop samples analyzed in FY2000 compared with FY2010. In FY2000, Field Crops comprised 47% of the total sample load but dropped to

33% in FY2010. In FY2000, Vegetables and Herbs comprised 17% of the total samples but jumped to 25% in FY2010. Fruits and Nuts samples also increased from 12% in FY2000 to 16% in FY2010. Most of the other crop types (Turf and Lawn, Conifers, Greenhouse, Forages, Ornamentals, Trees, Flowers and Tropical Plants, and Ornamental Grasses) remained fairly stable.

There was also a big change in sample type. Grower samples (predictive, diagnostic) comprised 83% of the sample load in FY2000 but only 59% in FY2010 while research samples, jumped from 17% in FY2000 to 40% in FY2010.

One big accomplishment was the completion of the Waste and Compost Analysis Guide. Check it out at <http://ncagr.gov/agronomi/pdf/wasteguide.pdf>

Research was done on the following projects:

- 1) Potassium fertilization of blackberries with Ron Gehl, Ph.D., NCSU Soil Science;
- 2) Effect of nitrogen and potassium fertilization on cotton leaf blade and petiole tissue readings with Keith Edmisten, Ph.D., and Seth Holt, NCSU Crop Science;
- 3) Waste analysis of poultry litter with Carl Crozier, Ph.D., NCSU Soil Science; and
- 4) Establishment of baseline data and tissue sampling procedures for hops with Rob Austin, NCSU Soil Science.

In addition, an internal study was conducted to determine the best leaf position and growth stage for lettuce tissue sampling as well as nutrient concentrations typically associated with each.

**Oklahoma:** Oklahoma State University soil testing lab ran a total of 59,769 samples in 2010. 33,029 were soil, the rest were various others including water and forage and animal waste. We purchased and installed a new Lachat Quickchem 8500. We have also purchased a new VariomAX analyzer for carbon and nitrogen. This should be installed later this month.

**South Carolina:** Clemson University, South Carolina, prepared by Kathy Moore

State Totals

Soils 57724 (40% increase from 5 years ago – running more fertilizer dealer samples)  
Plant 5084  
Feed 969 (60% decrease from 20 years ago – indication of the dairy farm trend in SC)  
Water 313  
Waste 1866  
Compost 121  
Other 7165 (mostly research solution samples)

Budget



Presently operating off our revenue (expenses including all operating, building maintenance, salaries and fringe) with some help from the fertilizer tax if needed at the end of the fiscal year. A 20 – 30% across the board fee increase would help to move us toward being totally self supporting, but we haven't been approved for any fee increases since 2006.

## Computers

Last October we purchased some new computers for data processing and other applications which had the Windows 7 operating system. Told that our access databases and all other applications would work within Windows 7 and we could install Windows XP within Windows 7 to run some older applications if needed. We had major server issues and programming problems and ended up taking Windows 7 off the computers and installing Windows XP.

***Tennessee:*** University of Tennessee Soil, Plant and Pest Center, Nashville, Submitted by: Debbie Joines, Manager

SPPC analyzes soil, forage, plant tissue samples with additional services of plant disease and insect diagnosis for producers, homeowners and researchers in all 95 counties of the state. These are fee based programs.

August 2009 thru September 2010, our sample totals were as follows:

Soil – 22,745  
Forage – 2,058  
Plant Problem/Disease ID – 660  
Insect ID – 264  
Golf Course Problem – 61

New instrumentation includes addition of a Perkin Elmer Optima 7300 DV ICP in June 2010, LabFit AS 3010-D Dual pH Analyzer (September), purchase of Lignin 4 and 5 way dispensers (DI water and extractant) and Wiley Mill for forage sample preparation. We have 1 full time lab technician, 1 full time diagnostician, 2 full time administrative support personnel and support for 3 student/part time employees.

## ***Texas:***

***TAMU:*** Moved into renovated cattle barn with no operational time loss. Certifying four acres as organic behind the building. Grad students working on biochar. Increased fees on everything except routine tests. Clients have not resisted new pricing. 49,077 soil samples, many were contractual for regulatory agencies – having to charge more for sample prep than analysis for many industries.

***UT-SFA*** runs 4000-5000 poultry litter samples, some soil samples. Not expecting to lose personnel.

***Virginia:***

- 1) A change in the Code of Virginia will require that any lab that performs soil or manure testing associated with a Virginia Pollution Abatement or NPDES permit to have tests performed by a NELAC certified lab as of the first of 2012.
- 2) As of May 25th, our new department Head is Dr. Tom Thompson, who came from Texas Tech. As of April 1<sup>st</sup> our new Extension Director is Dr Edwin Jones, who came from North Carolina State University.
- 3) In 2010, the lab received about 54,000 soil samples, which is about 7% more than the year before.
- 4) Last June we installed a new Spectro Arcos ICP instrument; retiring an ICAP with parts going back to the mid-1980's. Our other ICP is a Spectro Ciros Vision.
- 5) Two years ago (July 1, 2009), our testing fees increased. We are now charging landscaping samples \$10 for our routine soil fertility test, which is up from \$7. This test is performed at no charge for samples from commercial farmland.

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***Monday, June 20: meeting at the Agronomic Division at 4300 Reedy Creek Rd.***

**ADMINISTRATIVE SESSION**

***Host Institutions:***

**Dr. Colleen Hudak-Wise, Director, Agronomic Division- NCDA&CS:** welcomed the group to the largest public soil testing laboratory in the United States. And they offer other agronomic services. Safety is important as a value to the Division.

**Dr. Michael Wagger, Head, Soil Science, NC State:** North Carolina State University Department of Soil Science has strong roots in soils/soil fertility, but state is urbanizing with a current population of approximately 9,000,000. In response the department has become more involved in other soils areas, e.g. wastewater, wetlands, construction area management. The department is also working with niche crops such as hops. There are twenty-three faculty working in all soils sub-disciplines.

**Dr. David Monks, Asst. Director Research, NCARS- NCSU:** NCSU works closely with NCDA on recommendations within the 18 Experiment Station locations. Dr. Monks stressed the importance of the SERA IEG process. He also reflected on the importance of field days: NCSU is involved in 15 to 20 per year.

***Administrative Reports:***

**Research - Dr. Steve Workman, University of Kentucky:** The five-year term of this SERA IEG project ends in 2012. Continuance requires a new proposal for the directors to review. Material is provided on the format requested by the directors. A writing committee will be named at the conclusion of the business meeting on the next day.

**Extension- Dr. David Kissel, University of Georgia:** Absent due to illness.

*Technical Session:*

**Richard Reich, Asst. Commissioner of Agriculture: The Importance of agriculture to North Carolina**

Soil testing services are critical to modern agriculture. The science works!

Provided an overview of the changes in agriculture over the past 100 years. Agriculture is currently a \$70 billion industry in the state when all aspects are included. About two thirds of North Carolina agriculture is animal related: livestock/poultry/dairy. However it is actually very diverse. About 8% of farmers generate about 85% of farm income. Some 91% of the farms in the state are individual farms. There are about 165 Certified Organic Farms currently with the number increasing. There is one person assigned in each county encouraging locally produced food to be at least 10% of the diet. There are about 415 Pick Your Own operations, 135 Certified Roadside Farm Markets, about 100 Community Supported Ag's, and over 200 farmers markets. There has been growth of small poultry operations, pastured livestock, artisan dairies, and registered meat handlers. In fact the numbers of meat handlers has increased exponentially in last decade.

The state is working extensively in food safety. Sustainable Local Food Advisory Council was created by legislature in 2009, and there is a farm to school program. Agritourism is emerging. Wineries have expanded greatly in last 10 years. Farmland preservation is an issue as North Carolina was leading nation in farm loss prior to recession. Despite its prominence in the landscape, agricultural water use is about 1% of daily withdrawals.

North Carolina exports about \$3 billion annually in agricultural products. Sweet potatoes are a bright spot in exports but need to work on shelf life for oriental markets due to the length of transport. The state is addressing biofuel potential through a Biofuel Center of North Carolina. There are changes as the first ethanol plant recently ran for only six months, closed and recently declared bankruptcy.

An unique partnership fosters ag research in NC: there are 632 projects on Experiment Stations by 105 NCSU and NCAT faculty. Future demand for food is very, very strong.

**Dr. Jeana Myers, Agronomist, NCDA&CS Organic Production and Recommendations in North Carolina:**

She has recently initiated efforts to work on organic system fertility management on behalf of the division. She is examining the constraints that exist, including guidelines required for organic certification. If a farm sells less than \$5K /yr, it does not need to

file an organic operating plan, however it must still follow rules for larger operation with respect to operation. For fertility materials, see OMRI manual.

Cover crop/crop rotation plans are very, very important for organic production, particularly fertility management as N availability will largely depend on the cover crop. The soil testing question is whether we should offer soil N analysis, or rely on the published data for N availability from crops. Manures may only be used on perennial or crops not for humans, or incorporated 90 or 120 days before consumption. Broiler litter provides issues due to higher P content. Zinc issues are of interest, and need to be monitored in manure and compost. Compost must be done properly.

Amendments: low end of options due to expense, and need to monitor changes in OMRI manual to monitor revisions that occur. Feather meal is desired due to relatively high 13% N. Organic farmers want to boost microbial activity. P is biggest challenge in fertility management; manures and/or compost are options. Rock phosphate can be used as maintenance but is very, very, very slow. One management goal is to raise VAM levels for P nutrition. Potassium can usually be handled, but there was some discussion. There is a need to bring the organic information together for the client: she suggests a Matrix calculator. There are many disparate information sources such as Growing Small Farms and the Center for Environmental Farming Systems that need to be collated.

### **Dr. Eugene Kamprath, Professor Emeritus, NCSU: History of Soil Phosphorus in North Carolina**

Suggests everyone read Kamprath and Watson in the first phosphorus monograph for the reference to a paper by Dyer (1894) that suggested that the ideal extractant would be the pH of root cell sap (=3 by trials performed by Dyer). Based on this, he formulated citric acid extractant that may still be used in Great Britain.

Initially, North Carolina soils were low in P, however it was built up in cultivated soils by practices such as adding one ton per acre of 3-9-9 per acre per year on tobacco fields regardless of soil tests. The Piedmont area of the state has high buffering capacity soils whereas the Coastal Plain region has low buffering capacity soils, thus easy to buildup. There was early work on developing P critical levels in the different soils. Adolph Mehlich developed the Double Acid (M1) extractant based on the work described in Seatz's thesis of 1949. This extractant began to be used that year. The thesis work of NeSmith in 1956 addressed critical levels using M1. This work found that P rate needed to change as M1P was dependent on the buffer capacity as related to soil clay content. Jim Woodruff's masters thesis reinforced the importance of buffer capacity. Another question was that if P built up in soils, how long would it last? Kamprath, 1967 found a linear increase eight years after application of massive applications at 0 rate . . . at 22 lbs rate of additional amendment, there was a plateau with the prior applications. In long term work summarized by Bob McCollum 1991, 100 ppm M1P supplied adequate P for 14-16 years.

We learned in more recent years that P can leach! This is critical now that there's one pig per NC'ian! Reddy et al (1980) found that with very high app rates leads to deep downward movement. More P is required in higher buffered soils to maintain levels.

The M3 extractant (1981) extracts 1.5 to 2 more P than M1P. The desire was to use it to differentiate Piedmont from Coastal Plain soils, however it was not effective in that regard. New calibration data is needed, however clay content is a good measure of the buffer capacity of soils. The Phosphorus Loss Assessment Tool (PLAT) uses M3P as an input – historical research and data important in making P decisions today.

*Standing ovation followed questions.*

<the group decided to post Kamprath and Watson chapter on the SERA 6 website>

### **Michelle McGinnis, Agronomist, NCDS&CS: Vermicompost amended pine bark provides plant nutrients for *Hibiscus moshceutos* ‘Luna Bush’**

Study for her Ph.D. research. Vermicompost equals worms working waste materials. Have been found to reduce pathogen levels. Original rationale was working on swine waste. Product needs to be beneficial and affordable, and furthermore, not detrimental to crop production. Attributes have been found to be nutrients, humic substances, CEC, WHC, and anecdotal observations. Some 80’s research with greenhouse crops found inflection point with VC as 20% of the media mix which provided nutrients, but the plant response varied based on source and plant species. There has been decreased plant growth occasionally due to too much VC in the mix. Some literature found a “synergistic interaction of a variety of factors” which apparently means they did not or could not explain what happened. VC does not provide all nutrients needed: N insufficient, K and S were source dependent.

Pine bark primary nursery substrate in SE USA. Has advantages particularly in aeration, but lose WHC. Objective was to determine which input can be reduced by use of VC? 20% VC = or better P, Ca, Mg, S, and micronutrients. Found that VC could eliminate some inputs. Did not provide equivalent K. VC produced greater dry mass and buds. Commercialization is using lower % due to costs.

### **LUNCH –SPONSOR PRESENTATIONS**

**Bob Dussich, Spectro** – ARCOS: Advanced Roland Circle Optical System. Uses patented sealed optical system. Sealed optic allows for low UV elements e.g. Cl, Br, N. Compact build fits on ordinary benches.

Presented David Hardy a customer gift of an original horse-drawn plow from Maysville, NC. Purchased in Washington, NC in 1935 and used for 32 years to grow 52 acres of tobacco.

**Tom Danaher- Perkin Elmer** – Highlighting the newest instrument, Optima 8300, introduced in last month. Dual view: axial and radial in all instruments. Has Universal Data Acquisition. eNeb changes sample introduction system: forms a dense fog (will be shipped July/August, 2011). New Plasma Generation Technology (in new units only). Some software enhancements from customer comments.

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**Afternoon:** Tour the Agronomic Division Labs- Nematology, Plant/Waste/Solution/Media, and Soil Testing

**Other Tours:** Vinifera Wine Grape Soil Acidity Study- viewed a lysimeter greenhouse study using Vinifera wine grapes. Adam Pettit, Graduate Student, Horticulture Science.

Hops Research- learned about hops production in NC and toured hops yard to view hops varieties and also fertilization practices. Scott King, Extension Associate, Soil Science- NC State

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**SPONSORED DINNER** – Labfit, Perkin-Elmer, Spectro, ThermoFisher, Timberline

Bass Lake Community Center

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**Tuesday, June 21**

**8:00 – 10:00 CONCURRENT TECHNICAL SESSIONS**

**SPONSOR Presentation: Mike Black- ThermoFishers:** iCAP 6000 Series, duo or strictly radial. Charge Injection Device versus Charge Coupled Device

**Concurrent Sessions Updates**

**Laboratory, Kathy Moore, Moderator**

*Alternative soil N methods- Uttam Saha, UGA:* Potassium chloride extracted ammonium and nitrate-N in 36 Georgia soils were measured by diffusion-conductivity method and compared with results measured by distillation/titration method. The results suggested that the diffusion-conductivity method can be a suitable alternative to the troublesome and laborious distillation/titration method with deviation  $\pm$  10%.

*Microwave calibration and use- Brenda Cleveland, NCDA:* PLOSM laboratory calibrates five microwaves monthly to assure power settings for all microwaves meet Standard Operating Procedures. CEM procedure for calibration is followed to get 210 and 390 watts. After a microwave is calibrated, a NIST sample is processed as part of the verification of that step in the analysis.

*Light and super light samples- weighing and digestion- Leticia Sonon, UGA:* There was concern over the impact of weighing and transferring of super light materials on the subsequent digestion due to static. The use of an anti-static device did not change or affect concentration of

elements in digested materials. There were no different impacts in a number of different digesting solutions or procedures.

*Mehlich 3 Interlaboratory comparisons, EPA study – Tony Provin, Texas A&M University:*

Mehlich III is fairly forgiving in the laboratory and small deviations from the standard do not dramatically impact STP. Sample mass from scooping operations is the largest single factor and can significantly alter results between technicians and laboratories, i.e. stay close to the 1:10 ratio and all will be OK. Other factors still under consideration include short shelf life of the extractant, development of standards, calibration of ICPs to avoid matrix interferences created by the reagents, and more efficient laboratory design.

*Mehlich 3 Interlaboratory comparisons – Bob Miller, ALP and CSU:* Comparison of M III phosphorus ICP and spectrophotometer analysis showed significant differences for specific soils. ALP database soils showed more variation. High sand and low pH are correlated to the difference in M III P analysis, with more variation in low pH soils. An evaluation of inter-lab M III soil analyses using solution standards indicates 25% of laboratories' calibration curves are biased more than 5% from the known value.

### **Nutrient Management, Frank Sikora, Moderator**

David Hardy: Sulfur recommendations and M3 sulfur test. Reported on field tests with corn.

Jake Mower: Reported on using NIR for N determination in poultry litter to improve the prediction of N mineralization. Likely will replace combustion method currently in use with NIR.

Larry Oldham: Following the input of SERA 6 last year, more thorough evaluation of buffers was conducted. Sikora II was the most effective and will be tested further with the current MSU method (modified Woodruff).

Rao Mylavarapu: Florida incubation study resulted in great variability – led to discussion of how lime recommendations are actually made.

### **NCERA-13 Update: Manjula Nathan, Univ. of Missouri:**

NCR 13 website is under UM Division of Plant Sciences website.

Working on methodologies: particularly K, Antonio likes one done by Joern et al for that is a wet-based extraction. Most of the labs are trying to shift to the Sikora buffer method. Manjula is doing some field calibrations for lime work.

Soil testing workshop held in Bettendorf, IA last February was successful. Working on renewing Project with directors.

They will host quadrennial in 2012 in Wisconsin, on-campus with lodging about one block away. NCR 13 favors 8/27-8/31, and we can live with it. Wisconsin will have to check concerning the beginning of the UW fall semester

**Publications:** Frank Sikora, Hugh Savoy:

**Methods manual, Frank:** started two years ago, committee has met quarterly. Authors and reviewers have been active. Nearly all chapters are in final draft form . . . only 2-3 are not complete.

**Bulletin 470 on Procedure, Hugh:** Actually five years old, not reflecting the true status. Therefore needs to be updated. He will e-mail out in Word.

**NAPT Update-** Tony Provin: New coordinator on-board, from Utah State. New web interface to upload your sample analysis is not working, and will be addressed. They continue to need soils from the southeast. Committee will examine exactly what methods are being tested.

**Planning for the five-year plan renewal.**

The officers, Frank, David, and Larry will work as a writing committee.

Announcements: The 13<sup>th</sup> International Symposium of the Soil and Plant Analysis Council in Queenstown, New Zealand, April, 8-12, 2013.

SERA IEG 6 plans to meet in Kentucky in 2013 after the 2012 quadrennial is held in Wisconsin.

**ADJOURN**