Joint Meeting of the Regional Soil Testing Workgroups
North Central region (NCERA-13)
Southeastern region (SERA-6)
Northeastern region (NECC-1012)
Madison, Wisconsin
August 27-29, 2012

August 27: Monday afternoon – Joint Work Group Sessions

Welcome and Introductions – John Peters welcomed everyone, everyone introduced themself, and logistics for the activities were provided.

Soil test K research update – Antonio Mallarino and Carrie Laboski, Carrie presenting.

Addressing problems in soil K testing. Including temporal variation: instability in the fall, including plant uptake, weather, stalk recycling, etc. 5 locations in WI, grain and silage, range in textures and STK. 3 yrs, 4 reps, split plots. Did (spring STK-fall STK), and placed in quartiles: -1=lowest STK, -4=highest STK. Fixing K overwinter in most locations. Hancock location is unusual, generates some discussion. Mallarino data shows that SB K is lost from residue overwinter faster than corn K. 75% versus 40% lost by late fall (question about how residue was managed).

STK methods: looking at field moist methods, referring back to Mallarino et al JPA 1991. They had K indices. Used to 1989 then abandoned. Antonio looking at it through 2000's. Antonio Mallarino thinks the moist test is better, partially reduces the temporal variability. Now working on slurry version with company Solum. Will this work everywhere?

Back to WI: first study also looked at drying methods. UW uses Bray-1 for K, this study used it and ammonium acetate. 3/5 locations verified 1.2 factor, but one was low and one was high.

WI lessons: drying effect varies between locations. WI is different from IA!

Sulfur needs of alfalfa; Tools for sulfur management – Quirine Ketterings

Work came from answering concerns expressed by Extension audiences. Alfalfa is biggest remover of S from NY crops. Used to get a lot from atmospheric deposition, fell from 14 lbs S/acre in 80-84 down to 9 in 2008. Trials in 80's found no S deficiency, but times have changed.

1. Should S deficiency be expected? -found responsive sites: increased yield, not quality. S deficient on lighter texture, with no manure history

2. Can S fertilization be carried over to multiple years? - No, needs to be annual application

3. Develop critical levels for S tissue and soil testing?
   - Checked 0.25 from literature for tissue, 7/8 sites predicted

- 6/8 sites increased tissue S with added S
- S soil testing was not done in lab: looked at 6 solutions from literature
- Incubated 4 soils with number of rates
- Need to have pH>6.5 for results
- Tissue critical=0.27
- Soil critical=8 ppm calcium

4. Letting people know what to do with respect to S management?
   - Manage pH
   - Focus on coarse soils
   - No S where manure used
   - New critical values

The use of NIR technology in soil testing – Jake Mowrer

Intro to NIR

Adv: Quick, non-destructive, safe, no chemicals, accurate

Principles of NIR

Basics of it.

NIR experience at UGA SPWL

Routine: forage quality, TN in PL, cover crop residual N

Research: soil clay content and something else in litter

Nutrient removal database project and NuGIS –Manjula Nathan and Steve Phillips

Steve: provides example of using using NuGIS with net P use in Midwest
Manjula: working on updating the database for grain nutrient removal rates

Soil testing options for high tunnels – Bruce Hoskins

Maine has had tremendous increase in high tunnel adoption over past 5 years due to ability to 'hold' crops. 3-4 crops/year=high nutrient demand. Extension points: faster growth rate from more heat units, increased mineralization of organic nutrient sources; also unique problems: need ventilation, faster growth = nutrient deficiencies, also nutrient salt buildup. Tell growers you have created an irrigated desert. They have worked to develop a testing/recommendation system. Found interesting trends in HT rate trial, but disease terminated it early. For newer houses, routine analysis with additional checks on EC and available N.

Presentations by sponsors

Adjourn for Dinner Cruise on Lake Mendota

Tuesday, August 28, 2012

SERA6 Session

Welcome and Introductions, Frank Sikora presiding

Attendees: Robert Miller, Leticia Sonon, Uttam Saha, Larry Oldham, Jim Wang, Charles Mitchell, Gobena Huluka, Steve Heckedorn, Kathy Moore, Tony Provin, Rodney Henderson, Carl Crozier, Jake Mowrer, Hugh Savoy, Steve Phillips, Cindy Herron, Morteza Mozaffari, Hailin Zhang, David Hardy, Steve Workman, Frank Sikora

Administrative Advisors

Dr. David Kissel – Extension: not attending, the group recognized his son through a moment of silence

Dr. Steve Workman – Research: The new five year plan was developed by writing committee earlier this year. Directors will recommend approval upon developing timeline for manual, and a process for determining which publications will be reviewed.

Directors are putting emphasis on Impact Statements for multi-state projects. We are asked to work on this, and Steve will send reminder to group. *Clarification:* Impact Statements within state reports will be useful for this. Considerable discussion between the group and Dr. Workman as to why any federal funding does not funnel down to participants despite requests for more and more documentation.

Business meeting

- Send state reports to Larry Oldham
- Update on 5-yr renewal: See above
- Methods manual update
    - About 2/3 done with technical editing. Authors please recheck Frank's revisions by 10/1/2012
    - Where to publish? In past it was done by the Extension Service of the primary author. Suggestion: SSSA or SPAC? Western group discussed previously, it is available on SPAC as pdf with charge for hard copy.

- Poultry litter proposal by Charlie Mitchell

  Deferred to Carl Crozier: done several poultry litter studies and Cotton Incorporated has funded several different studies. Question arose as to whether this could be a SERA 6 publication. Carl had done some preliminary work lining up authors with the goal to collect southern poultry litter work into a coherent whole.

  Charles Mitchell: propose SERA 6 adopt this as a project and with the following volunteers as implementation committee.

Charles Mitchell
Jake Mowrer
Morteza Mozaffari
Carl Crozier
Leticia Sonon
Larry Oldham
Rao Mylavarapu
Hailin Zhang
Tony Provin

Carl Crozier will initiate follow up.

- Other business:

  Hugh Savoy: need to update the Bulletin 409 with an eye to condensing some content, i.e. tables. He will make contacts on this project.

- Electing an incoming secretary

  Discussion and private ballots. Leticia Sonon is the new secretary.

- Next years' meeting

  POST MEETING ADDENDUM: The 2013 meeting will be in Baton Rouge, LA June 16-18.

Technical Session: Please refer to the Presentations as they posted to the website.

Nitrogen analysis in manure: oven drying vs "as-is", Brenda Cleveland

Nutrient mineralization from organic fertilizers, Leticia Sonon

Refining nutrient availability indices for animal waste, David Hardy

Postponed to 2013: Developing sulfur recommendations based on the modified Adams-Evans buffer, Gobena Huluka

State Reports as submitted to Larry Oldham follow the minutes of August 29.

Lunch and depart for tour of Crave Brothers Dairy.

August 29, 2012

Joint Session

North Central region (NCERA-13)
Southeastern region (SERA-6)
Northeastern region (NECC-1012)

MAP update – Jerry Floren

ALP update – Bob Miller

NAPT update – Grant Cardon

NAPT database – Frank Sikora

Synopses of these presentations were made available in the meeting packet and can be shared further if needed.

Panel on status of method development and manuals in each region. Is there potential for a national manual?

SERA-6 – Frank Sikora
NCERA-13 – Brad Joern
NECC-1012 – Bruce Hoskins

The following is provided by Frank Sikora.

Summary of discussion on regional methods manuals and a possible national methods manual for soil testing

Each regional group develops their own methods manual. The joint meeting of the Northeastern, North Central, and Southeastern groups was an opportune time to discuss progress on updating each regional methods manual and the possibility of developing a common national manual. A panel discussion was held with Bruce Hoskins representing the Northeastern region, Brad Joern representing the North Central region, Frank Sikora representing the Southeastern region, and Bob Miller representing the Western region.

The Southeastern group started updating their methods manual in June 2009. There are currently two manuals that are being combined and updated in its entirety. About two-thirds of the manual is completed. Discussions were held in the Southeastern group at the meeting on where to publish the manual. Options discussed were Southern Cooperative Series Bulletin, Soil Science Society of America (SSSA) publication, and Soil and Plant Analysis Council (SPAC) publication. The manual can be posted on the Soil and Plant Analysis Council website for free download and users can be charged for printing costs for a hard copy.

The Northeastern group has updated their manual and the most current 2011 version is available on the web (http://ag.udel.edu/extension/agnr/soiltesting%20-%20TOC.html).

New chapters were developed on silicon and lead. Plans are to update chapters when needed, have the manual chapter available on the web, and not publish a hard copy.

The North Central group has their latest manual available on the web (http://extension.missouri.edu/explorepdf/specialb/sb1001.pdf) that was updated in 2011. They are in the process of editing select chapter needing updating. Manjula Nathan is editing all chapters for style and conformity. Like the Northeastern group, the manual will be made available on the group's website with no plans on publishing a hard copy.

The Western group last updated their manual in 2005. Bob plans on bringing up the issue of updating the manual at their next meeting. The manual is available on the SPAC website at a cost of $35 for a downloadable pdf version and $50 for a hard copy (https://www.spcouncil.com/catalog/product/10/).

Bob Miller reported on the history of developing a national manual within SSSA. In the 1980s, John Mortvedt spearheaded a plan to have common soil tests developed as Association of Official Analytical Chemist (AOAC) methods. Developing AOAC approved methods involves a lengthy process which includes detailed statistical evaluation. Yash Kalra led the effort to develop soil pH as an AOAC method which is currently published in the AOAC methods manual. There is a committee within SSSA to oversee this work which has included Hailin Zhang leading the effort to collect data on the Mehlich-3 method (S-889, Coordination of Official Methods of Soil Analysis Committee, https://www.soils.org/about-society/committees/S889). Since AOAC started charging about $35,000 for having a method approved, progress towards having AOAC-approved soil test methods has stalled.

Brad Joern indicated private soil test laboratories should be in on the discussion of a national methods manual since they are testing many more samples than public laboratories. He also expressed an idea of having a common chapter for methods used in each of the regions rather than duplicating material. He envisioned a user to go to a map of the United States, click on a state, and pertinent chapters of methods used in that state could be compiled for download.

Grant Cardon, coordinator of the North American Proficiency Testing (NAPT) program, mentioned the program cannot independently decide to offer a new method for proficiency testing to laboratories. He is looking at the regional groups to accept the validity of a new method before being included in the program. The method does not necessarily have to be an accepted standard method to be published in the regions methods manual. A method can be accepted and tested on a provisional basis.

Questions arose on how coordination could take place toward developing a national manual from the individual regional manuals. Joint meetings only occur every four years so it is not an opportune place to make progress on a national manual. The S889 committee within SSSA may be the best vehicle to make progress but should include regional soil test work groups and the soil test industry. Since methods are not moving forward for AOAC approval, the rigid statistical data for each of the methods may not be

required. An idea was brought forth to have a symposium within S8 at next year's SSSA meeting to discuss this topic.

Meeting Adjourned!

SERA 6 State Reports are below. Some fonts were changed for consistency.

Alabama State Report

→The total number of routine soil samples is about the same as it was last year (~25,000 samples), but about 3000 more than 2010 at the same time. Our non-routine soil, plant, forage and water analyses are about the same as last year this time.

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

→ There is no personnel change at our lab.

→Our vario MACRO CHN analyzer from Elementar is doing fine, but helium prices are rising almost monthly.

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

→We have published, "The Basis of Soil Testing in Alabama" and "Nutrient Recommendations Tables for Alabama Crops" online and hardcopy. Detailed information will be shared next year when they become live during our meeting.

→ We are working on offering "Soil Quality Test" that will focus on organic matter, CEC, texture and water holding capacity determination.

2012 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 26,653 samples including 1,032 forage, 283 plant and 198 soil (for diagnosis of nutrient deficiencies and/or toxicities), 1,355 dry- and 205 liquid-manure, 11,228 research plant, 2,376 research soil, and 9,446 prepared special samples during 2011. Additional samples were analyzed for the strawberry (386) and orchard (38) nutrient monitoring programs with clients from several states. Samples were submitted by growers, the general public, and researchers from various institutions and industries.

b. Currently, because of the drought and lack of forage crops, we have seen a large increase in non-traditional forages such as corn, milo, and rice stubble, sorghum sudangrass, and johnsongrass for nitrate and forage quality analyses. This increase has strained the labs resources for dryer space, grinding, and labor since we try to process these samples 1 to 2 days after receipt.

c. Databases of dry and liquid manure chemical properties were updated to include information from 2011 samples. Information on poultry litter WEP continues to be shared with the Arkansas Natural Resources Commission (ANRC) as a reference of mean values for nutrient management planning.

d. For 2012, the lab agreed not to accept any out of state soils for analysis in order to comply with the USDA stipulations for fire ant control in the state.

e. We are using a Spectro Arcos radial ICP for all of our samples except for chloride run on a 2000 model Cirros axial ICP. We use an Elementar Rapid N for plant tissue nitrogen and an Elementar Variomax for C/N analysis on soils, manures, and liquids. We use a Skalar SanPlus autoanalyzer for inorganic nitrogen in soil and manure.

f. The Fayetteville lab participated in the North American Proficiency Testing Programs in 2012. 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 5th consecutive year the Marianna Soil Test Laboratory analyzed a record number of soil samples. The total number of soil samples analyzed in 2011 was 178,632. Of this total, 163,721 were samples submitted by clientele and the remaining 14,911 samples were standard check soils analyzed for quality assurance. The number of grid soil samples analyzed in 2011 was 110,784 (up from 84,763 in 2010), which is approximately 68% of client samples received. Grid soil samples have increased about 19,000 samples per year since 2006, whereas the number of 'field average' samples has remained relatively constant (52,000 - 55,000). The annual lab summary and fertilizer sales data is published in the 2011 W.E. Sabbe Soil Fertility Research Series Bulletin http://arkansasagnews.uark.edu/6668.htm.

b. Organic matter analysis by Weight Loss on Ignition was performed on 938 soil samples in 2011.

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 soil pH robot system purchased (J-Chem company in St. Louis, MO) was expanded in 2011. The soil pH robot system, purchased in 2010, was upgraded from 4 electrodes to 12 electrodes to expand analytical capacity.

e. The Marianna lab currently operates four inductively coupled plasma (ICP) units. The four units were purchased and operational in 1997, 2006, 2010, and 2012.

We purchased a new Spectro-ARCOS 130 model ICP as a replacement for an older ICP (purchased in 1991) in early 2012. This summer we tested a Cetac (http://www.cetac.com/) sample introduction system for one ICAP (preliminary tests were satisfactory). We decided to purchase one unit for further evaluation during the 2012-2013 busy season.

f. The current Marianna laboratory was remodeled in 1984 to handle 40,000 samples per year, but the demand for soil testing services has increased rapidly. It is not uncommon for the Marianna Laboratory to receive 40,000 samples in one month. In order to gain a better understanding of how a modern efficient laboratory should be designed a delegation from the University of Arkansas toured the soil testing laboratories at the University of Georgia and North Carolina Department of Agriculture in June of 2011. The Arkansas group found their visit very informative and greatly appreciates the hospitality of our colleagues in N. Carolina and Georgia.

g. A project involving remodeling and new construction at the Marianna Lab has been approved by the University Of Arkansas Board Of Trustees. Architect interviews will begin in October. The first phase of remodeling has been to purchase and install a new soil drying oven capable of holding 13,000 samples (Wisconsin Oven Company). The oven has been purchased, delivered, and recently (August 2012) enclosed and should be operational in the fall of 2012.

Analytical Services Laboratories (ANSERV Labs), IFAS, University of Florida
State Report for SERA-IEG-6 Joint Meeting at Madison, WI, August, 2012

Number of samples analyzed, during FY11-12, at the Extension Soil Testing Lab increased by nearly 11% to 16,973 over FY10-11 and at the Analytical Research Lab the samples increased by nearly 6% to 23,089, during the same period. The number of samples at the NELAC certified Environmental Water Quality Lab decreased however by over 47% during that period as a major statewide water quality research project on turf grass ended that accounted for nearly 100,000 samples over six years.

The ANSERV Labs acquired two new instruments last year- 1) Spectro ARCOS ICP, installed 8/2011 and 2) Leco CNS Analyzer installed 6/2012. While new Spectro was purchased as a replacement for the previous 12 year old Spectro ICP, the Leco CNS Analyzer is expected to provide new tests and services to the clients, particularly to replace organic matter and TKN procedures.

The ANSERV Labs have hired an outside computer consultant to develop new LIMS2012 about a year ago. The work is almost complete and is expected to be deployed by December, 2012. The LIMS2012 will have a web based database and a front end, involving seven latest and different software packages that will help automate all the functions at the Labs with significant user friendly features.

There have been no changes to the personnel at the ANSERV Labs during the past year. However, the QA Officer position due to attrition at the end of Aug, 2012, will not be replaced on a permanent basis. A half-time person will be hired to help with the QA work through the temp agency.

University of Georgia State Report

Agricultural and Environmental Services Laboratories

(Soil, Plant, and Water Laboratory; Feeds and Environmental Water Laboratory; Pesticide and Hazardous Waste Laboratory; Trace Analysis Laboratory)

Sample Numbers:

The total number of samples received at the Agricultural and Environmental Services Laboratories (AESL) of the University of Georgia slightly decreased relative to last year's submission. The breakdown of these samples is shown in the table below.

Sample Type	May 2010 - April 2011	May 2010 - April 2011	Difference
Soils	79376	74243	-5133
Manures	2594	2426	-168
Waters	6614	8014	+1400
Plants	4878	4481	-397
Feed and Forages	2750	2919	+169
Microbiology	1665	1873	+208
Georgia EPD contract	169	1637	+1468
Other	1743	1883	+140
TOTAL	99789	97476	-2313

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:

- Work continues on testing of software to calculate the nitrogen mineralization from Winter cover crops and poultry litter. Farmer samples of cover crops were submitted in spring 2011 for evaluation of their N release. Poultry litter samples were analyzed and a robust calibration was generated for total N. NIR spectroscopy is used to provide some inputs for the model. Additional data is being collected to further test the model for cover crops, but total N by NIR technique is already made available to the public.

- The laboratory developed a test package to measure soil salinity to help farmers and the general public diagnose and manage problems associated with soil salinity.

New Instrumentation:

1) ICP - Spectro Arcos
2) Leco Trumac CN Analyzer

External Audits of Our 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

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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

Report prepared by:
Leticia Sonon

University of Kentucky state report for SERA6, 2012

Soil testing provided farmers, homeowners, greenhouse operators, and others with unbiased scientific information about the fertility status of their soils or greenhouse media. In partnership with the Cooperative Extension Service, lime and fertilizer recommendations are also provided that can often save the producer money by maximizing crop growth without excessive fertilizer application. We also offer analyses of animal wastes and nutrient solutions to inform producers of nutrient contents in these materials.

Numbers of samples analyzed in 2011 are shown in the table below.

Type	Number	% change from previous year
Agriculture	33,689	-10
Home lawn and garden	9,682	11
Commercial horticulture	883	4
Greenhouse media	69	-13
Research	6,970	-7
Atrazine residue in soil	13	30
Animal waste	367	-6
Nutrient solution	108	29
Soil nitrate	141	7
TOTAL	55,200	-6

Three refereed journal articles were published as shown below.

Sikora, F.J. 2012. Double-buffer methods revisited with focus on ionic strength and soil:solution ratio. Soil Sci. Soc. Am. J. 76:718–732.
Chien, S.H., F.J. Sikora, R.J. Gilkes, and M.J. McLaughlin. 2012. Comparing of the difference and balance methods to calculate percent recovery of fertilizer phosphorus applied to soils: a critical discussion. Nutr. Cycl. Agroecosyst 92: 1-8.
Sikora, F.J., P. Howe, D.Reid, D. Morgan, and E. Zimmer. 2011. Adopting a robotic pH instrument for soil and soil-buffer pH measurements in a soil test laboratory. Comm. Soil Sci. and Plant Anal. 42:617-632.

Bill Thom retired as director of the Division of Regulatory Services. Darrell Johnson is the new director as of August 1, 2012.

Louisiana State University
Soil Testing and Plant Analysis Laboratory
Report to SERA IEG-6

2012

The LSU AgCenter Soil Testing and Plant Analysis Laboratory analyzed 15,393 routine soils samples in 2011, which reflected an increase of 17% over the previous year and was primarily due to the implementation of a box sampling kit for home consumers. In addition, the lab analyzed 6278 plant samples and 6557 optional soil tests. The lab has made progress in becoming a self-supported operation.

The lab has been approved to update its LIMS and have it in use by next spring. The new LIMS is expected to greatly improve the flexibility of data management over the current system from sample receiving to data reporting.

The lab has evaluated the use of biochar made from sugarcane harvest trash for improving sugarcane growth and the result has been promising.

Mississippi State University Extension Service Soil Testing Laboratory
Mississippi State, MS

The MSU-ES Soil Testing Laboratory analyzed 24,406 soil and 2,517 tissue samples. These are 5.0 percent less soil samples and 32 percent less tissue sample than in 2011.

A nutrient management manual was published in both hard copy and web versions: Nutrient management guidelines for agronomic crops grown in Mississippi. Mississippi State University Extension Service Publication 2647.

A series of four 4-day trainings in nutrient and pest management was provided for all local and regional employees of the Natural Resource Conservation Service.

Dr. Bobby Golden, soil fertility research, located at the Delta Research and Extension Center is working on various calibration and correlation projects.

2012 SERA State Report
NCDA&CS Soil Testing Section
Fiscal Year 2011

The Soil Testing Section, analyzed 373,532 soil samples and issued 43,409 reports with fertilizer and/or lime recommendations in FY2011. Workloads continue to increase by a few percent each year.

The lab has transitioned to the AgVise soil grinder away from the Dynacrush. This grinder is a "workhorse" in comparison. We have modified the tops of the grinders and are having much lighter sieve/ catch pans made from plastic locally.

The target pH for Bermuda hay for pastures was changed from 6.5 to a 6.0. The original target of 6.5 was set since clover was often a part of pastures systems. Today, production is more monoculture grass so the target pH of 6.5 is not needed. On sandy, coastal plain soils, manganese deficiency was becoming more of a concern in small grain over-seeded in the fall and winter on pastures. Considerable alkalinity associated with lagoon effluent from swine operations along with lime recommendations when below pH 6.5 were causes of high pH and Mn problems.

The lab continued its efforts on designing a new LIMS system and revising its homeowner report. The new LIMS system and new report are now live as of July, 2012.

The **Soil Testing Section** cooperated in the following research projects:
1) P, K and lime rate studies for Vinifera wine grape production with John Havlin, Ph.D., NCSU Soil Science;
2) Evaluation of N sources in blueberry production with Bill Cline, NCSU Plant Pathology, and Mike Mainland, Ph.D., NCSU Horticultural Science;
3) Nitrogen, copper, and zinc availability to corn and wheat from land-applied anaerobic swine lagoon sludge in the North Carolina Coastal Plain with Jot Smyth, Ph.D.; Carl Crozier, Ph.D.; Dan Israel, Ph.D.; and Deanna Osmond, Ph.D., NCSU Soil Science;
4) Soil fertility of high-population, narrow-row corn production with Carl Crozier, Ph.D., NCSU Soil Science; and
5) Burley tobacco yield response to potassium fertilizer with Greg Hoyt, Ph.D., & Ron Gehl, Ph.D., NCSU Soil Science; and Bill Yarborough, NCDA&CS regional agronomist.

2012 SERA State Report
NCDA&CS Plant/Waste/Solution/Media Section
Fiscal Year 2011

The Plant/Waste/Solution/Media Section **(PWSM)** Section analyzed 11,621 plant tissue samples; 16,943 waste samples; 2,235 solution samples; and 347 soilless media samples in FY2011. It issued a total of 12,439 reports. This workload exceeds that of the previous year by about 2,000 samples.

The **PWSM Section** participated in three cooperative studies:
1) Evaluation of fertilizer rates in greenhouse production of Beauregard, Covington and Evangeline sweet potatoes with J. Schultheis, Ph.D., NCSU Horticultural Science
2) Mineralization, plant availability and water quality consequences of nitrogen and phosphorus in land-applied municipal biosolids with Jeffery White, Ph.D., NCSU Soil Science and David Hardy, Ph.D., NCDA&CS Agronomic Division
3) Poultry litter BMP extension & subsurface application technology evaluation with C.R. Crozier, NCSU Soil Science
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.

Publication (internal, educational):
NCDA&CS waste and compost analysis guide. McGinnis MS, Queen J, Buchanan M, Stokes C, Cleveland B 2011 http://www.ncagr.gov/agronomi/uyrwaste.htm

Oklahoma State University

2012 Annual Progress Report

Hailin Zhang, Director
Kendal Henderson, Manager
Soil, Water and Forage Analytical Laboratory

1. The total number of samples analyzed was 60,279 in 2011. We tested 33,846 soil, 4,787 water, 9,184 forage, 992 waste, 8 growth media, and 11,462 various research samples during the year.
2. We added an Elementar Carbon/Nitrogen Analyzer to improve our capacity on liquid manure sample analysis.
3. More plant tissue tests were conducted and our online reporting system was updated to include plant analysis interpretations.
4. We are in the process to purchase a LabFit pH equipment.

Clemson, South Carolina – State Report
Kathy Moore
2012

Sample Totals for 2011
Soil – 57,609
Plant – 3,058
Feed – 1,112
Water – 386
Waste – 1,961

Compost – 146
Other – 6,064

New Equipment
Ankom fat extractor for feed samples
Hamilton dilutor for nitrate solutions
Purchased service contract with Spectro for the ARCOS ICP
(Still also using the 20 year old TJA 61E – no service contract needed.)

2011-12 Tennessee State Report
Hugh Savoy, Debbie Joines

Over 24,400 soil tests were conducted and fertilizer/lime recommendations provided to Tennessee farmers and home owners during 2011. Numbers have remained good this year as well. A plant analysis program is now available to Tennessee producers through the Soil, Plant and Pest Center in Nashville.

Continuing education opportunities were made available to county agents, agri-business and others through work shops sponsored through the Tennessee Agricultural Production Association in both West and East Tennessee. Nutrient management training and updates were provided through written materials (extension and refereed journal), and participation in work shops, county, state, national and regional meetings. State 4H activities were supported through organizing and participation in the state land judging contest.

2. Three Year Educational Program Impacts Reported at the end of 2011

1. Hybrid bermudagrass hay K fertilizer rates reduced in 2009, from results of ongoing fertility research on low testing soils. TN producers benefited with savings up to $96.00 per acre (at highest K prices in this period) or as much as 28.8 million dollars per year in K input costs. Benefits to the environment are also realized due to increased N efficiency with appropriate K fertility.

2. Recommended P and K reduced in 2009 (verified correct by ongoing research) for row crops on 'high' testing soils are potentially saving TN producers $64.00 (2008 prices) per acre or over 19.2 million dollars per year for corn grain alone (highest consumer).

3. Continuing education and testing programs for Certified Crop Advisors in Tennessee have resulted in providing the agricultural industry and Extension with a more highly trained and professional work force (115 currently certified) to address the needs of Tennesee farmers and urban peoples.

4. High school 4H students (279) state wide and over 100 FFA high school students were introduced to Soil Science and an appreciation for 'soil' and its role in providing food and fiber through the State Land Judging Competition Program.

5. Nitrogen Rate demonstration data suggest the need to reduce yearly N inputs for hybrid bermudagrass hay production by one fourth of that currently recommended potentially saving producers on 17,000 acres across the state as much as $1,020,000 in production costs.

6. Factual information to assist NRCS in interpreting Mehlich 3 soil data was provided in the form of a web fact sheet. "Interpreting Mehlich 1 and 3 Soil Test Extractant Results for P and K in Tennessee". https://utextension.tennessee.edu/publications/Documents/W229.pdf.

Texas A & M – Tony Provin

The Texas A&M AgriLife Extension Service Soil, Water and Forage Testing Laboratory processed 24,744 soil, 2259water, 4759 plant/forage, 1177 biosolid and 8288 research samples during the 2011 calendar year. Additionally, the laboratory purchased a Spectro Blue ICP, Eltra Helios carbon analyzer, Timberline ammonia analyzer and a Metrohm titrator for water carbonate and bicarbonate analyses. The laboratory is also in the process of adopting a new accounting system what will be expanded into a global LIMS. Fertilizer calculators for both urban and ag clientele have been developed and placed on the laboratory's website. The laboratory has also finalized its invitro digestibility NIRS calibration efforts and is currently developing outreach materials for clientele on IVTD analyses. This effort will allow a better understanding of true forage digestibility of the states warm season perennial forages and how cultural practices, imparted by farmers, influences yield, nutrient requirements and forage value.

A new urban water quantity/quality outreach program is being developed to target homeowner and urban landscapes with the laboratory's primary focus on soil physical impairments, as well as, nutrient management.

Virginia Tech Soil Testing Laboratory – August 2012

1) We now have the capability to automatically e-mail reports to clients. In order to reduce printing and postage costs, clients do not receive both an e-mail and a printed report by USPS mail.

2) An exemption from state regulations was made that would have required any lab performing soil or manure testing for certain Virginia farms be a NELAP accredited lab.

3) In 2011, the lab received about 50,000 soil samples, which is about 7% less than the year before.