

Minutes  
Regional Soil Testing and Plant Analysis Committees  
(SERA-6, NCR-13 and NEC-47)

Monday, September 23, 1996

8:15 am The meeting was called to order by Wayne Sabbe (AR) who is Chair of SERA-6. The meeting was held in the facilities of the Agronomic Division, North Carolina Department of Agriculture.

Dr. Don Eaddy, Director of the Agronomic Division welcomed the group to North Carolina Department of Agriculture. He introduced Mr. Weldon Denny, Deputy Director of the North Carolina Department of Agriculture who welcomed us to North Carolina. On behalf of the College of Agriculture and Life Sciences at North Carolina State University, Dr. Georg Kriz welcomed the groups to Raleigh, NC. The College of Agriculture and Life Sciences at NCSU consists of the main campus at Raleigh and 15 outlying research stations, including a more recent program effort at one station on environmental farming systems. The state of North Carolina is 1st in flue cured tobacco and turkey production, 2nd in swine production, and 3rd in total poultry production in the US.

Dr. Maurice Horton (USDA/CSREES) then spoke to the group about happenings at the Federal level. He is now part of the Natural Resources and Environmental Group, and will be moving to the 8th floor of the Aerospace Bldg. New programs of interest include: (1) EQIP - will implement the conservation provisions of the new Farm Bill which combines some programs of past farm legislation, and is being administered by NRCS; (2) Fund for Rural America - this program was funded at about \$100 million with 1/3 for research, 1/3 for rural development, and 1/3 for use by the Secretary as recommended by an advisory committee; (3) Water Quality Special Grants - funding for this program will have no new \$ which are basically already committed; (4) Water Quality Incentive Programs - no new programs in this area; (5) Water Quality Monitoring - several agencies and support groups are attempting to get a national monitoring project underway; (6) Manure Management - there is an increasing emphasis on animal waste, and about 50% of EQIP funds are being targeted at animal waste; and (7) Precision Farming - at the current time, interest within USDA is rather low.

**Proficiency Testing**

Bob Miller (CA) addressed the three groups on attempts in the Western Region to address issues in this area. They would like to establish a dialogue on these issues by sponsoring a conference in analytical methods. In their area of high value crop production, there is an increasing emphasis for labs to demonstrate analytical accuracy. The first step in this process is to circulate uniform samples between labs to determine accuracy of methods used in soil testing. The Council started this process about 3 years ago but it needs to be expanded.

Ann Wolf (PA) presented some information on what driving forces exist in the Northeast Region to demonstrate greater lab proficiency. She sees the continuum (and all parts) as being important (Soil sample --> Analysis --> Recommendations). Calibration data is an integral part of the Recommendations and must be fed into this continuum. The driving forces in the Northeast are concerns for the environment and economic nutrient management which includes fertilizer and wastes. There is a proposal to create a North American testing program which would require uniform samples, administration of the program, and representation of the university labs in any effort undertaken.

An open discussion of this topic followed:

Bruce Hoskins (ME) - they are doing 8-10,000 samples/year of soil, plant tissue and wastes. They are currently involved in both an international and Council programs.

Don Horneck (Agri-Check) - runs a private lab in Oregon. His comments were that we need to resolve some issues including weighing vs. scooping samples, and the Bray-Kurtz P1 should be the true P1 as reported in original research not as modified by labs.

Maurice Watson (OH) then described the FSA program used at the Ohio State labs including the process, its limits, actions that are taken, and fees for the program.

Nancy Wolf (AR) then described experiences in this area with the University of Arkansas labs. They have two state university labs. She outlined benefits to their labs, and expressed concerns for two areas: (1) releasing certified information and how labs will react; and (2) will this process lead to "one" method of extraction in order for certification continuity?

#### **Quality Assurance/Quality Control**

Bill Baker (AR) made several points in addressing the groups: (1) emphasized that there are differences between labs on reported results; (2) grid sampling of fields has highlighted sample and field differences; (3) proposed some guidelines for agric. diagnostic labs for evaluation and he seeks input from all attendees; and (4) he is ready to move ahead in his efforts to ensure labs have an outline they can follow in organizing information needed to finalize this effort.

Ann Wolf (PA) emphasized that QA/QC is needed for internal checking and result handling that will make proficiency testing accurate and meaningful.

Maurice Watson (OH) reviewed the NC history and the Ohio State process to get this system underway in the respective labs.

Comments: administration of such a program needs more permanent data storage for uniform sample results; stronger internal training programs are needed in labs; and uniform guidelines need to be adopted.

#### Additional Comments on Proficiency Testing

There is some concern that Proficiency Testing can lead to a certification process by regulators that would have legal and regulatory implications.

The proficiency process is intended to reduce the need for any type of lab certification because it is a self-initiated process that includes corrective measures of discussing results and subsequent followup.

Proficiency testing has increasing importance with site specific sampling in agriculture.

#### **Atlanta Soil Testing Workshop**

Owen Plank (GA) attended on behalf of the Southern Region and communicated his comments to Wayne Sabbe as Owen could not attend this meeting. His comments included: (1) soil characteristics should dictate what extraction method to use; (2) reasons for having the meeting convened by Keith Hodnot were not clear; and (3) there was an attempt at compiling soil extractants used across the US.

#### **Soil and Plant Analysis Council**

They are publishing a guide for plant analysis methods. The 1997 Soil and Plant Analysis Conference will be held from August 2-7, 1997 with a strong international participation. The theme of this conference is: The past, present and future of Precision Ag. The program will also cover testing methods for P and metals, and nutrient recommendations. There will be ample opportunity for poster sessions on a wide range of topics related to soil testing and plant analysis.

Monday, September 23, 1996

1:00 pm

#### **Communications**

Charles Mitchell (AL) outlined the efforts of SERA-6 to develop and publish various publications. Recent pubs include peanut recommendations for the Coastal Plains, soil test procedures used in the Southern Region, and recommendations for taking soil samples. SERA-6 is moving toward developing Fact Sheets (one page sheets on topics of high interest), the first of which was on organic matter. Two states have added specific data and published this fact sheet as an Extension pub with the SERA-6 disclaimer at the bottom of the first page. The Southern Region Experiment Station and Extension Service Directors have endorsed putting all future pubs on electronic media as the only method that will receive financial support.

#### **Multi-State Recommendation Efforts**

Ron Gelderman (SD) described efforts to coordinate recommendations for ND, SD, and western MN. Their success in this area is largely based on a 20 year history of face-to-face discussions. In 1990, a meeting was held with reps from each state with a more direct purpose of bringing recommendation information together. This stage was also urged by private consultants and NCR-13 to increase creditability of recommendations. The meeting resulted in

states keeping separate pubs for recommendations with these recommendations being the same in the affected areas. They further identified calibration data gaps, agreed to conduct some cooperative soil test calibration research, and cooperated in an effort to inform Extension agents and dealers on these recommendations.

Daryl Warnecke (MI) then described the efforts involving MI, IN, and OH. Country Mark Cooperative was the facilitator in bringing together department chairs and others for discussions. Three years of time have been expended to date for frank and open discussions. These meetings have focused on corn, soybeans, wheat and alfalfa with the observation that there were some very narrow data bases for some recommendations with these crops. Some large disagreement remains with K recommendations between the three states. The respective states have continued to maintain in-state recommendations for other crops and one pub was issued for all 3 states with recommendations for corn, soybeans, wheat and alfalfa. This pub is available from Mich. St. Univ. (\$1 per copy).

#### **Electronic Media**

Ed Hanlon (FL) discussed electronic media and use in soil test labs. There needs to be an overall university commitment to electronic technology. At FL, there is a total program that includes training, communications, and marketing under a system, FAERS. This has been highly successful based on the number of "hits". They also have a mobile computer unit of labs for community college teachers. It is his feeling that there are still challenges with informing people that information is available on the WWWeb. When a broad electronic media system is used for information delivery, there are still concerns with how to reference pubs, and that county offices in several states do not have access to the system. However, pub cost should be less when using this delivery.

#### **Animal Manures**

John Peters (WI) discussed some results with manure testing. There are some lab method and sampling issues that still need study. The N. Central states have an exchange system that John collected samples for and coordinated. Samples were taken at agitation with liquids, and solids were sampled, dried and ground. The lab means for exchange samples were as follows (lbs N+P2O5+K2O): Dairy liquid 29+15+24/1000 gal.; Dairy solids 13+6+18/ton; and Swine liquid 48+28+21/1000 gal. These values are close to the book values used by the Midwest Plan Service. Some observations that may be important are: (1) mixing or agitation of liquid manures decreases variability; (2) the solids layer on ponds has lower dry matter and nutrient value is lower in August than in March; (3) lab variability is higher with solid samples than liquid samples; and (4) between lab variability for the exchange was generally very low with greater variability in reporting due to moisture differences.

Doug Beegle (PA) discussed delivering results to users. There is a need to deliver results in terms of availability based on a fertilizer equivalent basis, recommenders want to know whether nutrients are in the organic or inorganic form, and predicting release of nutrients through decomposition is still a challenge. There is some indication that recommenders should encourage either the PSNT or PPNT for corn when growers apply manure. Nitrogen availability varies with delays in incorporation, either mechanically or by rainfall of at least 0.5". There are still some questions on estimating N components in manures. Liquids and some treated manures have higher ammonium-nitrogen than solids. Organic N is higher in liquids than solids with values higher as we move South in the U.S. PA is looking carefully at the residual N based on application frequency with some recent thoughts being different than earlier published information: Near continuous manure application (at least 8 out of 10 years) 25% of most recent rate of application, and for frequent application (4 to 8 years out of 10) 15% of the most recent rate of application. The decay series is based on the following: Dairy manure-12% of last years rate, 5% of the rate applied 2 years ago, and 2% of the rate applied 3 years ago; and for poultry manure-10% of last years rate, 5% of the rate applied 2 years ago, and 5% of the rate applied 3 years ago. P and K availability range from 80-100% based on some research by Jokela (VT).

Some related areas of concern include: (1) buildup of N on waste amended pastures that are grazed as only about 15% of N is removed in meat; (2) Missouri will probably cut back on fertilizer recommendations on pastures, water needs to be present in every paddock, and legumes in the pasture will reduce N recommendations; (3) Florida pointed out that the group needs to share any information for grazing and waste applied N; and (4) research is needed on residual of waste N when applied to legumes as several studies are underway with some yield increase attributed to Ca, S, and K with dairy and poultry manure while a need to maintain awareness on metal toxicities for some crops is recognized.

In general discussion, Bill Jokela (VT) asked whether the three regions represented need to maintain some type of electronic communication by having a page for each region?

Following a break, the participants were divided into several groups and conducted through the lab facilities of the Agronomic Division of the North Carolina Department of Agriculture. Participants observed facilities associated with soil testing, plant analysis, soil nematode testing, the computer facilities, and office area.

Wayne Sabbe (AR) called the meeting to order at 8:10 am and the proposed agenda was adopted. The minutes of the 1995 meeting were corrected with some items from the FL state report and adopted as corrected.

**Administration Report**

George Kriz (NCSU)

1. The Fund for Rural America program was brought to the groups attention for possible future funding opportunities.

2. There has been no reply from the VI on having a future meeting.

3. Dr. Kriz will clarify the numbering series for Southern Regional Bulletins and fact sheets.

4. Tom Helms is the new executive director of the Experiment Station Directors.

Wayne Jordan (GA) Dr. Jordan is in a new role as Director of Lab Services at GA.

1. With the EQIP program, there is some strain between NRCS and CSREES at the national level: NRCS is in a leading role with technical assistance, research and education.

2. We are challenged to manage change in agriculture as there are several new initiatives with no funding for implementation (Risk management and marketing, integrated animal production, conservation, and responding to change).

3. Clientele continue to ask for rapid accessibility to reports, information and data bases.

4. The emphasis is shifting from gate keeper to gate opener.

5. Several states and some national programs are moving to performance based measures related to future budgeting.

6. The interest in site specific or precision agriculture will affect the future of many programs.

7. In several states, privatization of lab functions is getting more study with an eye to reducing costs.

**Publication Status Reports**

Plant Analysis-Ray Campbell (NCDA) Plant analysis pub is needed. Twenty-nine chapters of the proposed S. Region Bull. have been completed. Some major crops are still missing and Ray is moving to contact substitutes for doing chapters not completed. As the policy for hard copy printing has changed, the bulletin will be put on the WWW. The bulletin will be reviewed and numbered before putting on the WWW. As new information becomes available, the appropriate chapters will be revised, reviewed and put on the WWW with the date of revision.

Southern Region Bulletin 190-Ed Hanlon (FL) Fifty hard copies will be printed. The bulletin should be available on the WWW through FARES. Some tables of the revised bulletin are larger than previous editions for interpretation. There has been some reduction in the no. of extractants used in the S. Region. Does the SERA-6 group need a home page?

Soil Nitrogen Analysis-Hugh Savoy (TN) Was not present.

Heavy Metals in Soils-Gary Lessman (TN) Several extractants are being used not only in the S. Region but throughout the country. Some elements have extensive data bases while others are quite scant. It was generally agreed that USEPA pretty much determines current soil methodology for wastes and hazardous sites with it's methods published as SW 846 (4 large notebooks). Gary determined that individual states pretty much used the EPA methods but when we are interested in correlation to plant uptake, there is very little research with these methods. Most states have conducted research with methods aimed at the correlation need. There is some question of whether this group should be heavily involved in heavy metals testing of soils.

Maurice Horton (USDA/CSREES)-administrative report to Southern Region. The Northeast group would like the 3 regions represented at this meeting to send reps that would begin drafting a publication on animal waste. He then discussed the Rural America program mentioned earlier by Dr. Kriz. This is a multi-agency and multi-disciplinary approach for some funding within USDA. Applications for funding must include Extension and transfer technology. They are interested in end products that will be produced from these projects.

Action was taken by the Southern Region to ask John Kovar (LA) to represent the Southern Region in coordinating the drafting and development of a multi-region publication on animal waste. The publication will focus primarily on manure analysis procedures. Bill Baker (AR) encouraged the group's membership to respond with comments to John for guidelines in developing this publication.

**Sample Exchange Program**-Hampton Bryant (AL) discussed the upcoming exchange program which will involve samples of soils, plant tissue, and prepared solutions. He had no handouts at this meeting, and will send the exchange samples within a month. These samples will be mailed to the states. Comments: Maybe this group needs to study whether we can provide a service to more than state labs by supplying reference soil samples. The Southern Region has soils located in several states (AL, GA, NC, and KY).

**SERA-6 Future Structure**-Wayne Sabbe (AR) led a discussion on group structure for the future. The current committee structure is not necessarily all directed to producing publications. Is some group business more applicable to Task Forces rather than committees? Comments: 1. Pubs take considerable time for review and production; 2. Current committee function is more directed to issues and maybe could be better handled by Task Forces, however, we as a group need to stay focused as directed by issues identified by the executive committee; 3. Peanut pub was well-focused and published in a relatively short time; 4. Long-range or interpretative publications seem to take a long time to write and produce; 5. Need to consider that

publication on electronic media, as directed by Southern Directors, requires a high degree of responsibility by someone, and we should consider designating 2-3 people to be responsible for putting pubs on electronic media and updating as necessary; 6. Any home page management should rest with the executive director's office; 7. We should seriously consider establishing a Task Force on recommendations and recommendation policy for both the Experiment Station and Coop. Extension. This can be proposed to the Directors from SERA-6; and 8. Who is the audience for pubs on electronic media and who will access this information? Suggestions should be given to John Kovar (LA).

Charles Mitchell (AL) requested that we develop a publication on interpreting recommendations for cotton for Coastal Plain and Delta soils. All states with cotton acreage in these situations should be asked to participate.

#### **Secretary Nominations**

The Nominations Committee placed the name of Kathy Moore (SC) before the group for election which was approved unanimously beginning with the 1997 meeting.

**1997 Meeting Location**-John Kovar (LA) invited SERA-6 to hold its 1997 meeting in Louisiana. (This was confirmed by a later email to the Secretary). The meeting will be held June 8-10, 1997 at the Conference Center in Baton Rouge, LA.

#### **State Reports**

**AL**-the past year has been good for soil testing. Commodity groups in AL have committed funds for a new building including space for handling and analyzing a number of special samples. The lab is handling about 3400 samples per year, and there is some need to update calibration precision and reporting of results to consultants. Extension is pushing an effort for more attention to precision agriculture. There is a recent experiment station pub from Auburn relating soil test P and runoff water P.

Discussion: Precision agriculture is becoming an issue as it moves south from the North Central states. Labs need to maintain precision in analysis but field variability is still very large. Sampling schemes are being rapidly adopted on many farms but field size in southern states tends to be smaller. Feeling of the group is that precision agriculture and its' intensive sampling programs require greater knowledge of agronomy not just soils. It seems that both soil testing and plant analysis function more as a monitoring tool when extractable levels are above medium. GA has a state and Federally funded lab that is concentrating on environmental and precision agriculture systems with newer technology options.

**FL**-The program for CCA training is underway with over 100 participants the first year, with 70% passing exam the 1st year, and 60% passing exam the 2nd year. They have a reciprocity agreement with both GA and AL. New studies are underway with P laden clays from the phosphate mining area, ammonium bicarbonate EDTA extractant indicated a lower P

soil test before response to fertilization was noted, they continue to operate the Hydrologic Unit Area animal waste lab, they have acquired their 2nd ICP unit for the lab, and they have an oversight committee for raising funds for lab equipment replacement. They finished last year with 109,363 samples analyzed by the lab.

**NC (NCSU)**-Fred Cox reported he is devoting considerable effort to studying waste in soils, water runoff composition, heavy metals in the greenhouse (pH effects), and evaluating Mehlich III as an extractant for Cu and Zn.

**NCDA**-Ray Tucker reported they are analyzing about 240,000 soil samples per year in the lab. They feel that precision agriculture will increase the number of samples coming to the lab, conversion to a new computer system is moving forward, new recommendations are being developed, and new fact sheets are being published for producers (Media Notes).

**NCDA**-Ray Campbell reported that plant analysis is being used more much for monitoring in NC, and there is some sensitivity related to waste issues which has increased number of samples that appears to be related to the state certification program for waste application.

Discussion and action: It was moved, seconded and passed to have SERA-6 serve as a sponsor of the North American Proficiency Testing Program.

**VA**-Steve Donohue shared results of an ICP survey from 15 states, funding for lab operations looks better within the college for replacement of faculty and county agents, precision agriculture has some interest among Extension specialists, new recommendations were just published, lab analyzed about 25,000 soil samples last year, and they are now charging \$7 per sample.

**AR**-Wayne Sabbe reported that the college has a new name (Dale A. Bumpers College of Agriculture, Food and Life Sciences), many of their programs are moving to outlying centers, they have on-going programs in precision agriculture and Zn deficiency, and last year they analyzed about 20,000 samples (forages-1400 and manures-1600).

**GA**-Wayne Jordan reported that in 1995, about 81,000 soil samples were analyzed, and '96 has seen about an 8.5% increase with about 107,000 total samples (1995) for all areas. They have a new report form, are piloting an electronic retrieval system of getting sample information from the counties, the college is experiencing some redirection of programs with some emphasis on research centers, they are working to revise the lab manual, and they have a new Auto-Analyzer for petiole and water nitrate.

**KY**-Vern Case reported the lab analyzed about 42,000 soil samples last year, and a few manure samples which has increased already this year related to the newer versions of conservation and nutrient management programs with NRCS. Since Jan. 1, the lab has been routinely analyzing and reporting soil pH, buffer pH, and Mehlich III extractable P, K, Ca, Mg, and Zn routinely. Bill Thom mentioned some

retirements in the Agronomy Dept. that will be replaced as they occur over the next 12-24 months.

**TN**-they have new research programs in foliar analysis with cotton and with nitrogen, there is precision agriculture research programs in place at the Milan station, and last year they analyzed about 34,000 soil samples.

**LA**-John Kovar reported that LSU has a new Experiment Station Director, the Agriculture Campus Chancellor will retire at the end of 1996, about 15,000 soil and 150 water samples were analyzed last year.

**OK**-Gordon Johnson reported they have a new lab director (Halin Huwang Zhang), analyzed soil samples have remained about 25-30,000 per year, routine sample cost is now \$10, there is new research related to N application timing and chlorophyll sensor use, and after reviewing soil test results have found that 50% of the samples do not need P and 70% do not need K.

**SC**-Kathy Moore reported that last year they analyzed about 30,000 soil, 2500 feed, 2500 ~~water~~, 300 ~~forage~~ and 300 animal waste samples, they have developed a new reporting form, they need to rework electronic reporting and data collection within the lab, they are in the process of revising soil test recommendations, the lab is now fully within the Extension Service, and there has been some realignment of faculty to either Soils or Land and Natural Resources.

Jim Woodruff of US Borax reported they have a multi-state project to study nitrogen/boron interactions in cotton, and have a project for studying boron effects on canola oil quality.

**TX**-the lab will remain in College Station, they are planning to purchase a 2nd ICP unit, they are embarking on a new phase of computerization, there is a renewed interest in doing more calibration and correlation with different extractants than those presently being used in the lab, they are reviewing some of the lab procedures relationships to quick test kits available in the state, last year the lab analyzed about 20,000 routine soil samples, about 1000 were analyzed for heavy metals, analyzed about 12,000 plant tissue samples, and analyzed about 1500 water samples.

#### **1997 Officers**

John Kovar (LA) was installed as the new chair, and Bill Thom (KY) became the new chair-elect. These offices are for two years. Kathy Moore (SC) was earlier elected as the new Secretary for two years.

The committees will be reviewed although it was the consensus of the group that the current committees continue to exist in some form. Sample Exchange-continue; a Quality Assurance/Quality Control group might be label a Task Force; that the Interpretation and Recommendation Committee remain a standing committee (move to gather information and publish on cotton recommendations for K on Coastal Plains and Delta soils); that Electronic Communications become a committee;

and that we look at establishing a committee related to Precision Agriculture.

The Secretary was directed to write a resolution to the administrators of Dr. Wayne Sabbe outlining his diligent efforts and contributions to SERA-6.

Adjourned at 3:35 pm