

Minutes of the Thirty-Sixth Annual Meeting
SOUTHERN RESEARCH INFORMATION EXCHANGE GROUP
(SREIG-18)

June 11-12, 1990

Clemson Holiday Inn, Clemson, South Carolina

SRIEG-18 was called to order by Chairman Charles Mitchell at 8 a.m. An official mailing list for the group is enclosed.

Dean James R. Fischer, Dean for Agric.Res. and Director South Carolina Agric.Expt.Stn., and Dr. Ralph Franklin, Head, Department of Agronomy and Soils, welcomed the group to South Carolina and to Clemson University. Both stressed the need for strong exploration of environmental issues surrounding agricultural testing, especially in the area of animal waste and N release.

Dr. Leonard Parks discussed details of the meeting regarding transportation and the planned food functions. Dr. Parks acknowledged Dr. Bob Dussich, representative of the Thermo Jarrell-Ash, who sponsored the informal get-together on Sunday afternoon; Dr. Jim Woodruff, US Borax, who sponsored the coffee breaks throughout the meetings, and Mr. Hilton Rogers, S.C. Agricultural Chemical and Fertilizer Association, whose group sponsored the evening meal.

In his opening comments, Dr. Mitchell noted that the direction of SRIEG-18 has slowly changed throughout the years. Originally starting out as a methodology group, the group has been quite active in the use of soil plant and water testing for applied issues. The current strong emphasis on applied agricultural and environmental issues blended with the current level of methodology and basic research information appears to function well for our very active group. Dr. Mitchell also emphasized that all active members within SRIEG-18 should be involved in at least one committee and requested that the members sign the committee roster of their choice.

Dr. George Kriz, North Carolina State, SRIEG-18 advisor, commented on the results of a survey of 300 major agricultural groups. Results of the survey showed that the major concerns of these groups included environmental issues, added value to agricultural products, and food safety. He emphasized the significance of the survey in which increased production was not the most important goal to these groups. In other comments, Dr. Kriz emphasized the past efforts of this group regarding publications. He stated that the longevity of this group is an indication that the Southern Directors believe SRIEG-18 is functioning well and addressing current topics and issues through its publications. Dr. Kriz also welcomed the peanut fertility specialists who were attending the SRIEG-18 meeting for the first time. He stated the Southern Directors believe it is best to address the needs of peanut fertility researchers

and extension specialists within the overall umbrella of SRIEG-18. He also noted that SRIEG-18 was originally created to discuss and formulate commonality among the southeastern states. This objective appears to be addressed, in that ten years ago there were some eight different soil extractants being used throughout the region. Today, there are only four extractants.

SOIL SAMPLING COMMITTEE: W. Sabbe

Dr. Sabbe led a discussion concerning the past topics that the Soil Sampling Committee addressed including turf sampling, soil spacial variability, and sampling of no tillage and reduced tillage fields. Sampling with increasing depth results in possible dilution when considering environmental issues. Surface applied lime to pastures also presents difficult sampling questions. The group supported the idea of having a publication which addressed the problems of soil sampling. The proposed publication would deal only with soil sampling procedures and not address analysis techniques.

REFERENCE SOILS COMMITTEE: R. Isaac

Dr. Isaac led a review of the soil test information collected from several states on the new reference soil, Okolona (Handout 1). Presently the reference soils committee has two reference soils from Alabama, one from North Carolina, one from Louisiana, one from Puerto Rico, and the new one from Mississippi. The sample exchange will be conducted for next year's meeting (Handout 2). Dr. Isaac will also include one extra check sample from his laboratory. In addition to comparing analytical results, each state will make an interpretation of these results for a specified crop. The purpose of the reference soils are to augment the quality assurance programs of each of the laboratories. Dr. Isaac encouraged the group to use these reference soils on a frequent basis to build up a current reference soils data base.

LIMING COMMITTEE: J. Kidder

The Liming Committee was inactive this year after having completed the Liming Reference publication. The need for continuation of this particular committee was also discussed. However, most of the group considered liming to be an important part of southern regional agriculture. The group agreed that lime should be added to benefit the crop and not just to adjust soil pH. A discussion of Mg needs with respect to liming and other sources revealed that most states base the decision to use dolomitic limestone on pH if it is below the target pH and if the Mg level is below some critical value. If only the Mg level is below the critical value, then most states make a recommendation for another source of Mg.

NUTRIENT RECOMMENDATIONS AND ENVIRONMENTAL QUALITY COMMITTEE: N. Miller

Dr. Miller conducted a discussion centering around NO₃-N surveys from each of the states. She stressed that any future publications which would be forthcoming from SRIEG-18 regarding environmental quality and nutrient recommendations would need to be extremely accurate. Once such a publication is in the public domain, many rule makers and user groups will be using that publication.

Arkansas reported that a number of state and federal groups work together to deal with the problem of N in water sources with the task of compiling a data base to be used for subsequent decision making (Handout 3). In approximately 350 water samples taken throughout the state, only 2% exceeded the current EPA limit of 10 ppm NO₃-N. The group discussed the legal aspects of publishing of N levels and the approximate geographic location of the sample.

Georgia reported on a survey of rural water with similar results to those of Arkansas. The State of Georgia surveyed deep wells but found no high N levels in any of the wells. The request sheet currently used by Georgia for analysis of well water includes information concerning well diameter and well depth.

Alabama also found low NO₃-N in well waters (Handout 4). Those waters testing high in NO₃-N were usually found to be from some point source pollution. Louisiana reported similar results to those of Alabama (Handout 5).

The Extension Service in North Carolina had surveyed 4600 wells finding that 2.5 % of those wells were above the EPA standard for NO₃-N. Most of these wells were located on the coast and were quite shallow. Seventy percent of the wells tested less than 1 ppm NO₃-N. The North Carolina legislature has enacted a nutrient management package which includes cost sharing and is supported by the State Soil and Water Conservation Commission including costs for manure spreading.

In a survey involving 200 wells in Kentucky, low NO₃-N present in all. However, most water sources are from either spring or surface water reserves. In these two categories, over 10% exceeded the NO₃-N limit. Many springs test quite high. Twenty-five percent of those springs tested were above the EPA limit.

Virginia reported that a participation in a nutrient management program is on a volunteer basis at this time. The Extension Service is training specialists from other state departments to assist farmers in creating a sound nutrient management budget for specific farms.

Tennessee reported finding only isolated NO₃-N problems, usually resulting from some specific point source problem.

The group discussed the human and food chain effects of high NO₃-N in water sources. In general, the group believed that the 10 ppm NO₃-N set by EPA should be questioned. However, all agreed that background surveys, such as those discussed above, are needed to focus additional effort in the problem areas within each state.

The group also discussed the Nutrient Management Computer Program Symposium which was recently held in Tulsa, OK. The Symposium was well attended and it highlighted the efforts of both research and extension in the area of water quality and nutrient management.

Oklahoma pointed out that some counties had reported well water greater than the EPA limit. This report enraged some within the state legislature resulting in the proposal of strong legislation in water quality. However, in reviewing USGS information from the 1950's as well as fertilizer usage within each of these counties, it was found that some of the counties using the most fertilizer actually had reduced NO₃-N in the well water. The conclusion that much of the NO₃-N found in the wells was not from surface applied fertilizer, but rather from naturally occurring sources, was obvious.

AMENDED SOILS COMMITTEE: G. Lessman and E. Hanlon

Dr. Lessman led the group in a discussion of data which he had collected from several states indicating upper or toxic levels for heavy metals. Data from Mississippi showed no uptake trends in wheat from metal supplied in sludge. Tennessee data reflected that increased uptake was observed when pH was lowered. The pH was lowered as a result of increasing levels of sludge. In other data, a Zn toxicity level of 220 ppm was identified in peanut leaves. Two new publications by SSSA will deal with heavy metals and micronutrients. These publications are scheduled for release sometime in late 1990 or early 1991.

Dr. Lessman distributed the newly proposed limits for loading of metals from sludge, as well as an article dealing with copper and zinc sulfate additions to soil (Handout 6,7).

Dr. Hanlon led the group in a discussion of recent work by Dr. J.J. Street. Dr. Street, in long term sludge amended soils, used both the DTPA and 0.1 M HCl to extract Zn and Cd. The results of the 15-year experiment showed that the DTPA extractant worked well within about three years of the application of sludge for estimating plant uptake of each of these metals. However, in longer time periods, the use of the 0.1 M HCl extractant proved to be superior in estimating the possibility of plant uptake. Additionally, the latter extractant proved to be superior in separating out previous loadings of these two elements.

AMENDED SOILS COMMITTEE: R. Tucker and R. Campbell

Data were presented to the group concerning extractable M-III Zn and Cu levels following poultry manure addition to the soil (Handout 8). The increased levels of Cu and Zn added through poultry manure could be reduced by changing the feed mixture. In addition, control of soil pH is necessary for increasing the loading rates of poultry manure. The North Carolina laboratory conducts an analysis of wastes to predict plant availability of nutrients from the waste product. The assumption is made that nutrient release is equal to mineralization rates minus any losses from leaching or volatilization. A factor is also added to the equation based upon the environmental sensitivity of the element in question. This factor is estimated using the amount of nutrient from the waste plus the soil test results from the land scheduled to receive the waste. An assumption is made about the critical level which will result in possible environmental or toxic effect to the plant. Using subtraction of the soil test value from the assumed critical level, the computer program predicts the total amount of loading for the waste. When the initial soil test is close to this upper soil test level, the program recommends caution or actually lowers the recommended rate to avoid reaching this higher soil test level. At this time, N in the waste drives the calculations, not P.

INTERPRETATION COMMITTEE: J. Camberato

Dr. J. Camberato discussed with the group his research efforts in presidedress soil nitrate testing. He pointed out that spring weather affects organic matter decomposition and that the soil test should be taken early enough to allow adjustment of N fertilizer but also late enough to allow initial decomposition of organic matter and subsequent release of NO₃-N. A level of 21 to 25 ppm NO₃-N was found to be critical in soil tests from the upper 1 foot. This critical range is used in several states. There is poor correlation with yield response to N additions. However, the presidedress soil nitrate test can identify non-responsive sites. In research conducted on the Piedmont, soil samples down to 2 feet did not contain the added N. The assumption was that N had leached below the 2-foot level. In research on Coastal Plain soils, most of the N was found in the third foot.

Other states are also testing for NO₃-N. Oklahoma asks for two samples: a "0 to 6 inch" depth and a "6 to 24 inch" depth for both wheat and cotton. Arkansas recommends a 0 to 6 inch and a "6 to a specified" depth (the grower specifies the sampling depth and a computer program adjusts the resulting analytical result). This test is used for cotton and as a precautionary measure for forages if N levels are elevated. Texas uses a "0 to 6" and a "6 to 12" inch depth subtracting the extractable levels found in these two samples from the fertilizer recommendation.

NCR-13 REPORT: K. Andrews

The NCR-13 group meets yearly in St. Louis, usually in late October. Bulletin 221 (Handout 9) from the NCR group addresses the standardization of methodology throughout the region. Several researchers are comparing the loss-on-ignition method of determination vs. the Walkley Black method for organic matter determination. The M-III has been adopted by several of the NCR-13 states. Two states report that K extracted by the M-III should be adjusted for cation exchange capacity (CEC). Wisconsin is working on a comparison of ICP P vs. colorimetric P. Publications will be forthcoming addressing reduced/no tillage soil sampling in the North Central region. Within the region, DRIS has not found widespread use. In Iowa, a program entitled The Integrated Crop Management Program has been developed. In this program, the Extension Service covers training and testing charges in the first year for all participants. The financial burden of testing is gradually transferred to the grower. In the fourth year, the grower assumes all financial responsibility. This program was well received and is now in several counties with waiting lists for training. Iowa is also using the presidedress N test to estimate nitrate needs for corn at sidedressing. Iowa now has a law which standardizes the reporting method for all laboratories within the state. In addition, all Iowa labs participate in soil sample exchanges.

CSRS REPORT: R. Volk

CSRS expects approximately nine million dollars in new research money to become available in the next fiscal year. Departmental chairs and heads will have the request for proposals in OCT90. The turnaround time on these proposals is quite short, therefore, Dr. Volk encouraged the group to start preparations of proposals soon. Dr. C. Smith will be retiring from CSRS with a resulting open position. Dr. Volk currently has a 1-yr appointment to CSRS and plans to transfer back to the university system after his appointment expires. Last year, approximately 6 million dollars were provided for water quality research. Of the 266 projects submitted last year, only 46 projects were funded. The directors chose to fund projects on a regional basis with approximately 1.2 million dollars going to each region. Most projects involved the use of large plots and were funded for approximately 5 years each. Dr. Volk also discussed the Agricultural Research Initiative with a current proposed funding level of approximately 500 million dollars. Some of this money is proposed as formula funds, a portion will be for water quality work, and additional monies will be available through the competitive grant system. Dr. Volk also discussed the importance of residual NO₃-N testing and urged the group to consider grant funds for research of this topic. He also pointed out the disposal problems of Cr in organic wastes as being of critical concern.

SRIEG-18 PROCEDURES FOR PUBLICATIONS

Dr. Kriz said that reviewed manuscripts for publication by the SRIEG-18 must be screened by all of the Directors in the southern region. After the group completes the review of the manuscript, 15 copies should be sent to Dr. Kriz who will distribute them among the Southern Directors. The Directors provide cursory reviews of the material as well as the total number of copies that each state wishes to receive. After receiving these numbers, an additional 500 is kept on file for the region. When a manuscript is submitted to Dr. Kriz, he requested that the authors include an estimated cost for printing 1,000, 2,000, 5,000, and 10,000 copies. Dr. Kriz also recommended that the cover sheet follow similar designs as previous SRIEG-18 publications. It is the responsibility of the members of the group to provide peer reviews for all manuscripts, however the review by the directors also includes suggested improvements to the manuscript.

PEANUT FERTILITY COMMITTEE: G. Gascho and J. Adams, Jr.

An initial peanut fertility coordination group meeting was held in Headland, AL, in November of 1989 with 20 in attendance. Dr. Gascho reviewed peanut fertility requirements suggesting that research to date shows improved peanut response to residual fertility. Calcium is critical in the pegging zone, since the Ca must enter from the soil solution directly into the hull for proper formation. Dr. Gascho reviewed the peanut fertility recommendations for Alabama, Georgia, and Florida, pointing out that there are differences among the recommendations. He also discussed the difference in recommendation among these states for Runner vs. Virginia type peanuts. He stated that K recommendations appear quite high when considering the actual response of peanut to this nutrient in the field. A definite link exists between additions of high K fertilizer and decreased Ca in the soil.

Dr. J. Adams reviewed the research program for peanuts in Alabama. He stated that lime recommendations should be applied and then disked, not turned due to the positioning of Ca within the soil profile. The latest Alabama research findings revealed that several runner cultivars have similar soil test calibrations. He also stated that critical values have been identified as 35 lb K/ac and 8 lb P/ac for the M-I extractant. A rotation consisting of bahiagrass and peanut appears to be quite successful in Alabama. He also stated that these research findings were accomplished using on-farm research/demonstration techniques.

The group discussed peanut fertility in detail and it was found that the methodology (scooping vs. weighing) could account for most of the differences in calibration scales among states. High gypsum in the pegging zone may also release additional Al³⁺ with resulting loss in peanut yields. Magnesium deficiency in peanuts was hard to find in any of the states, even with low soil test values. But, Mg was found to leach when gypsum was added into the pegging zone. Additionally, a need for much higher Ca was noted when producing seed peanuts, as in the case of most Florida operations.

The group agreed that the Peanut Fertility Committee should continue to work toward more uniform recommendations among the southeastern states.

PLANT ANALYSIS COMMITTEE: O. Plank

Most of the chapters of the new plant analysis manual for the SRIEG-18 group have been completed (Handout 10). Dr. Plank expects to forward a reviewed copy to Dr. Kriz in August of 1990. Dr. Plank also discussed with the group the possibility of a new publication dealing with plant analysis interpretation and proper sampling.

SOIL AND MEDIA DIAGNOSTIC COMMITTEE: S. Donahue

The soil and media reference manual which is composed of alternate methods of analysis is in the final review stage needing only small editorial changes (Handout 11). The group also decided to include the Azomethine-H method for boron determination.

NOMINATING COMMITTEE: C. Evans

Dr. Evans discussed the Nominating Committee recommendations for Secretary, Vice Chairman and Chairman. After voting, Dr. John Jared was elected Chairman; Dr. Ed Hanlon was elected as Vice Chairman; and Dr. Wayne Sabbe was elected as Secretary of the SRIEG-18 group.

MEETING LOCATION:

The location of the next SRIEG-18 meeting in 1991 will be at College Station, Texas, 9-11JUN91. Contact person for the meeting will be Dr. Larry Unruh.

STATE REPORTS

Texas: Dr. Larry Unruh reported to the group that Texas has just created a new position which he is occupying in direct support of soil test calibration and recommendation procedures in Texas. He also reported that the Texas A&M laboratory is running NO₃-N by the Hydrazine method. Dr. Unruh has found interferences from Ca, Mg, and K in this procedure. He is also actively exploring new liming procedures and recommendations.

Alabama: Dr. Clyde Evans reported that the Auburn laboratory has just recently installed a new data acquisition system using PC's and laser printers. He also reported that the program which has been developed for interfacing the computers with laboratory instrumentation may soon be released publicly.

Arkansas: Dr. Wayne Sabbe reported that Dr. Bill Baker is at the Marianna laboratory while Dr. Cliff Snyder is working with the main soil testing laboratory at Fayetteville. He also told the group that Dr. Dick Maples, a long time member of SRIEG-18, has retired this year.

Florida: Dr. Hanlon passed out two publications dealing with vegetable crop nutrient requirements and a circular dealing with the interpretations and recommendations for the Extension Soil Testing Laboratory in Florida. Mr. Jim DeVore reported that the laboratory information management system has been in operation for three months at the Extension Soil Testing Laboratory. The laboratory has just received approval from the Florida Department of Environmental Regulation for a comprehensive quality assurance program to be used in environmental testing. Dr. Gerald Kidder reported that the chemical movement models developed by Dr. Nofziger and Dr. Hornsby have been expanded to include lateral movement of materials in soils.

Georgia: Dr. Owen Plank reported that the Georgia system has reviewed all of the current recommendations with special attention focusing on nitrogen recommendations and waste materials. He also stated that he has developed an expert system for soil test recommendations. This program should be released to the public within two months. Due to a reduction of crop acreages there was a decrease in samples for the Georgia laboratory this past year. Dr. Plank also showed the group a copy of his recently published Plant Analysis Handbook for Georgia.

Dr. Robert Isaac indicated that the Georgia laboratory would be acquiring an ion chromatograph for the water analysis program. The additional structure to the Georgia laboratory facilities has been completed.

Kentucky: Dr. Bill Thom indicated that studies are ongoing regarding differences between ICAP-P vs. Colorometric-P. The biggest correction factor appears to be an adjustment for Cu in the ICAP analyzed samples. He also reported that all soil testing results will be delivered electronically to county offices by 1991. Soil sample volume at the laboratory has remained steady this year. Kentucky researchers and extension people are focusing on a review of the liming requirements for various crops.

Louisiana: Dr. John Kovar reported that loss-on-ignition methodology is being explored as a replacement to the more traditional Walkley-Black determination for organic matter. He also reported an increase in quality assurance efforts within the laboratory and is satisfied with the outcome of this effort.

Mississippi: Dr. Keith Crouse reported that the autoanalyzer system within the laboratory is being upgraded. Water analyses have increased over the past year at the Mississippi laboratory.

North Carolina: Dr. Ray Campbell reported that the legislature has targeted \$7 million for a new testing facility but because of other budgetary constraints the project has been placed on hold. He reported an increase in both plant and waste testing over the past year. Microirrigation water testing is also on the increase for vegetable production within the state. Computer automation continues to be a high priority at the North Carolina laboratory.

Dr. Ray Tucker reported that the sample volume at the laboratory has remained steady (Handout 12). He encouraged the group to continue to strive for uniformity of methodology among states. He also reported that Mn deficiency/toxicity was being studied in a cooperative effort with North Carolina A&T. He also stressed the value of 5-year summaries for crop meetings. These data, when averaged over 5 years, provide a substantial data base for decisions regarding fertility status of soils for specific commodities within a general geographical area (county).

Oklahoma: Dr. Gordon Johnson stated that the Oklahoma laboratory has switched entirely to a microcomputer and is using a laser printer for all test data reporting. Equipment has been acquired for testing of protein, ADF, NDF, and NIR for forages. Oklahoma has a new fertilizer check-off system which will contribute an estimated \$200,000 per year specifically for soil fertility research. He also reported that his effort in software development is continuing with release of a new program in the near future.

South Carolina: Dr. Bob Lippert stated that the South Carolina laboratory has been able to decrease sample turnaround time. Results are now electronically reported directly to the counties. He also stated that manure testing for nutrient management purposes is also expanding. NO3-N kits from two suppliers' are being studied for in-field testing.

Tennessee: Dr. John Jared reported that water quality is a big issue in Tennessee and management schemes to support increased or improved water quality are being pushed within the state. Soil sample volume at the laboratory has remained steady this past year. Dr. Hugh Savoy reported that work is ongoing within the laboratory for electronic data collection from each on the instruments. Dr. Gary Lessman announced the scheduled meeting in Cincinnati, Ohio, in July concerning microelements in agriculture.

Virginia: Dr. Steve Donahoe reported that the Virginia laboratory is currently using two ICAP's with PC's interfacing throughout the laboratory.

OTHER BUSINESS

A motion was made and unanimously approved to draft a resolution acknowledging the long-term contributions of Mr. Dick Maples to SRIEG-18. Mitchell agreed to prepare a resolution to be approved by the Executive Committee.

Dr. Charles Mitchell expressed his thanks to our South Carolina hosts once again. Dr. Jared then took over as Chairman of SRIEG-18. He led a brief discussion on the direction of committee assignments which will be forthcoming. He also discussed with the group the upcoming joint meeting with NCR-13 in 1992. The thirty-sixth annual meeting of SRIEG-18 was officially closed at 12:30 p.m., 12JUN90.