

MINUTES

29TH SOUTHERN REGIONAL RESEARCH INFORMATION

Exchange Group of Soil Testing and Plant Analysis

Gainesville, Florida

June 14, 1983

Welcome

- A. Dr. Jim Davidson, Assistant Dean of Agricultural Research, University of Florida - introduced by Dean Phue.

Commented on Florida's growth. In recent times, high-tech people moving in. Agriculture is very diversified; crops include corn, soybeans, fruits (citrus). State ranks number one in ornamentals. There are 52 commodities with a value of \$10,000,000/year. University of Florida has 600 full-time faculty members, 18 academic departments, 22 research centers. Forty-five % of faculty are PhD's who work off-campus in research and extension. In 1976, started low energy research (LET - Low Energy Technology). State ranks number one in use of fertilizer and pesticides in the nation due to sandy soils and tendency to leach nutrients. The most recent contamination problem is Temik due to shallow wells.

In Florida, many crops are high value cash crops grossing \$15,000 - \$17,000/acre (vegetable, ornamentals, etc.). Nitrate contamination of soil water is a major problem and EPA will issue restrictions on nitrate in the future. Soil and plant scientist must improve methods of N use.

- B. Dr. Bill Blue, Acting Chairman, Department of Agronomy, University of Florida - introduced by Dean Rhue.

Extended a welcome to Florida and mentioned that the agronomy department had been without a chairman for one year. He has had good cooperation from faculty and everything had run smoothly. Dr. Bryan McNeil, incoming chairman, to arrive August 20, 1983 from Washington. Agronomy department has 25 faculty positions with 5 currently unfilled. There are 14 soil scientist at branch research stations. Indicated department composed primarily of plant scientists and expressed need for coordinating soil fertility research with soil tests in Florida. Gave Dr. Rhue credit for bridging gap between soil and crop specialists. There are 64 graduate students in agronomy with 10% of them foreign students. Off-campus personnel utilized in teaching programs.

Business Meeting

Owen Plank, workgroup chairman, introduced Dr. Peck as the representative of NCR 13 and Dr. George Chris. The remaining members introduced themselves and Dr. Gordon Johnson suggested a list of past and future meeting places for the workgroup be prepared.

Committee Reports

A. Soil Samples Exchange - Malcolm Sumner.

Twelve soil samples with variable P levels were sent to all participating laboratories. These were used to compare soil test values and fertilizer recommendations among states.

pH - water pH varied between 5.85 - 6.3 among laboratories. Values improved considerably among laboratories when pH measured 1N KCl and standard deviations were lower. Suggested all laboratories measure pH in 1N KEL.

P - test values were variable among laboratories because methods vary. No basis for comparison.

K - consistent test values among laboratories using same methods. Otherwise, considerable variation among methods. Most laboratories using Mehlich I extract.

Ca - good agreement among laboratories using similar methods but variation occurred among laboratories because of differences in methodology.

Mg - consistent test values irrespective of procedure with the exception of Texas.

Fertilizer recommendations requested from states were for experiments in Georgia where corn response data was available. Those for N varied considerably among states. This was primarily due to differences in the philosophy of fertilization adopted by individual states. Work of Sumner showed no response from irrigated corn to N levels greater than 185 lb/A. The highest yields obtained in his study were 200 - 250 bu/A and he concluded 180 - 200 lb/A of N was sufficient. This corresponded to about 1 lb N/bu of corn. He had no measure of residual N in his study but emphasized the requested recommended rate was for a 200 bu/A yield.

Recommendations for P_2O_5 were fairly consistent for the Mehlich I extractant but the response data indicated that they may not be high enough.

Recommendations for K_2O were generally higher than necessary as indicated by yield response data. Likewise, many laboratories recommended lime (some as high as 6000 lb/A) when there was no response to lime in the field.

B. Soil Test Interpretation- J. D. Lancaster

Discussed variability in soil test interpretation among laboratories and the implication this has for fertilizer recommendations. Nutrient recommendations at rates higher than necessary for maximum yield should be justified on the basis of soil buildup or reasons other than crop yield. Uniform interpretation should be based on the use of similar response curves among laboratories. Mitcherlich equation predicts yield response for some nutrients but not others (P - good; K - bad). In general, soil test response data does not fit the Mitcherlich equation, perhaps because the intercept differs from zero. Dr. Lancaster discussed an array of topics relating to the percent sufficiency index as a means of making fertilizer recommendations.

C. Reference Procedures - Bob Issac

Discussed reference method bulletin for Southern Region and requested members to review it and inform the committee of errors.

Gordon Johnson informed group that revisions for Bulletin 190 had been received and that it should be printed within the year.

Steve Donahue discussed the objectives of bulletin 289 and indicated the purpose was to revise methods and select new procedures. This was accomplished by means of a questionnaire and ballot vote from all representatives. The volumn method was adopted and representatives voted on 23 procedures, 11 of which were adopted. This was based on a vote margin of 2/3 of the total votes cast.

D. Liaison Committee - C. O. Plank

Dr. Ted Peck, NCR-13 representative, circulated minutes of last NCR-13 meeting and a bulletin summarizing 100 years of work on the Morrow Research plots. Also distributed Proceeding of the 1983 Illinois Fertility Conference. Indicated that NCR-13 conducts soil-plant workshops every two years in conjunction with commercial laboratories in an effort to improve relationships. Past workshops have included as many as 70 people and the next one is scheduled for November 1 - 2, 1983.

Dr. Peck discussed the desirability of a combined meeting with members of NRC-13 and SRIEGSTPA-18 in the future. Suggested the meeting could be held in a motel near a transportation center and that many people should be on the program with an opportunity to become better acquainted with each other.

Owen Plank asked for suggestions on a joint meeting with NCR-13 and appointed a committee to decide a location, date, and agenda for such a meeting. Gordon Johnson suggested Memphis, Tennessee as a potential meeting site.

E. Liming Committee:

Freddy Raspberry discussed committee objectives and distributed titration data generated by Wayne Sabbe.

Jerry Kidder discussed lime requirements for various crops based on liming to a given pH. Major discrepancy is depth of soil to be limed. No-till liming is effective to a depth of only 3-4 inches and no adjustment in lime rates were made to compensate for differences in depth. Major concern in no-till is effectiveness of herbicides. Seven states have lime requirements with no regard for soils, soil depth, etc.

Dr. Mehlich discussed the influence of clay mineralogy on lime needs based on soil pH and base saturation. The degree of base saturation necessary is dependent on type of clay.

Clyde Evans discussed incubation studies using rates of $\text{Ca}(\text{OH})_2$. Lime rates required by this method were about 50% of those determined by the Adams-Evans buffer method.

Malcolm Sumner discussed pH electrode theory and concluded should measure salt pH to eliminate liquid junction potential and salt effects.

Dr. George Kriz

Eluded to importance of reference method publications. Washington views agricultural researchers as a semi-scientific group. Hatch funds increased 2% but major emphasis by USDA is on soil conservation. Discussed future needs - consistency among states in analyses and interpretation. Consider environmental impact of fertilizer use and don't over fertilize. Develop relationships with consultants.

State Reports

Alabama - Has changed from weighing to scooping with computer interfaced with balance recording weight.

Arkansas - Late, wet spring. Wheat monitoring program growing. Constructing office and laboratory space in Marianna. Dick Maples expressed concern about the utility of short-term fertility experiments.

Florida - Kidder reported they had installed a microcomputer in the laboratory and plan to connect it to mainframe computer. This will allow extension agents to receive reports directly. Reviewing pH requirements for several crops. Measuring 4 cm^3 samples in lieu of weighing and assuming a weight of 5 g.

Georgia - Sumner discussed subsoil acidity. Has had good response to surface - applied gypsum which apparently ameliorates subsoil acidity and gives better root growth.

Issacc reported on new N analytical technique. Measures $\text{NH}_4\text{-N}$ on corn leaves using I. R. Has good correlation with

State Reports

Kjeldhal method (500 samples). Plan to add computer stations in laboratory to replace current system and reduce manual data transfer.

Plank indicated they have microcomputers in 13 counties and raw soil test data can be fed directly to agent who can give recommendations to grower. Cuts turn-around-time to 2 days from time laboratory receives samples. A formal report is sent later. Plan to convert to an index for soil test results in future. Plant data can be handled same as soil data and they plan to expand system to 157 counties eventually.

Kentucky - John Harrison offered Kentucky as location for joint meeting with NCR-13. Has set up regional laboratory and changed price scale. Making B recommendations for corn when less than 1 lb in soil and less than 5 ppm B in plant tissue.

Louisiana - Brubacker retired and Rodney Henderson is new laboratory director.

Mississippi - Freddy Raspberry reported they will charge \$3.00 for pH, P, K, Ca, Mg, Zn, Mn, O. M. and lime requirement beginning in July. Redesigned soil test report. Samples down 10%. 160,000 in 1981.

North Carolina - Ray Tucker handed out S deficiency data on corn and a manufacturer's brochure for soil scoops.

Fred Cox discussed Mn availability indices for M-1 and M-3 extractants. Made comments on water-solubility of various Mn sources.

Oklahoma - Gordon Johnson and Ed Handlin have found that M-3 extractant is good and they expect to adopt it in the near future. Handlin discussed forage analysis with scrubber on digester.

South Carolina - Charles Mitchell reported on soil test recommendations using computer. Soil test summary published for 1982. 24% of S. C. soils have pH greater than 6.5. Increased use of lime and minimum tillage in S. C. Discussed Mid-Atlantic soil test work group activities.

Tennessee - Joe Matthews discussed costs and elements analyzed. No book keeping problems with fee schedule. Does considerable forage analysis.

Texas - Carl Gray reviewed correlation work. Compared several extractants using soil samples from fertility plots with yield records. Suggested soil sample exchanges will be conducted on soils with yield response data.

State Reports

Virginia - Steve Donahue - working on automatic pH unit and is now operational. Will show slides at American Society of Agronomy meetings. Does 6 samples at a time and has cut time in half.

Committee Apointments

1. Liaison - Dean Rhue, Bill Thom and Dick Maples to coordinate meeting with NCR-13.
2. Microcomputer - Steve Donahue.
3. Slide Coordinator - Ray Tucker.