

**Mid-Atlantic Soil Test Work Group
Minutes of the 1987 Meeting**

March 4-5, 1987

The 1987 meeting of the Mid-Atlantic Soil Test Work Group (MASTWG) was held on March 4-5 at the Southern States building in Richmond, Virginia. The meeting was attended by the following representatives of state, university and private soil testing laboratories:

North Carolina:	R. Tucker R. Rhodes G. Minor R. Campbell
Virginia:	S. Donahue G. Hawkins
Delaware:	J. T. Sims S. Heckendorn
Maryland:	A. Bandel J. Buriel
West Virginia:	L. Bennett H. Ghazi
Pennsylvania State:	D. Beegle
University of Georgia:	O. Plank
A & L Laboratories:	P. Chu
Agrico:	R. Lockman
Brookside Laboratories:	M. Flock
Southern States:	C. Hubbard

March 4, 1987

Sample Exchange

The 1987 soil sample exchange was coordinated by the North Carolina Department of Agriculture. The exchange used six soils, four from an ongoing phosphorus study conducted by Dr. Fred Cox and two from other areas in North Carolina. The plant sample exchange used plant samples taken from the same soils. In general, the analytical results obtained between laboratories were in close agreement, as were the fertilizer recommendations made based on these analyses. Several points were made during the discussion of these results, however:

1. Lime Requirement: Despite almost identical water pH values, there were considerable differences in recommended lime rates for the Piedmont soil used in this study (from 1.5 - 4.5 tons/acre). Some of this was attributed to differences in target pH among states (ranging from 5.8 -6.2) and to the different methods used to estimate buffering capacity of the soils (i.e. buffer pH vs. soil textural class). The consensus seemed to be that none of the recommendations would overlime the soil and that regular soil testing would be an adequate method of insuring that pH remained close to the target value.
2. Base Saturation: Variations in % base saturation were noted for the University of Delaware and attributed to the different method used to calculate this value. Delaware uses KCl exchangeable acidity and ammonium acetate extractable K, Ca, Mg to calculate % base saturation, while most other states calculate the value from a buffer pH and soil test levels of K, Ca, Mg.
3. Phosphorus: Primary question still seems to be the necessity of application of P when soil test levels are high or very high. Some labs (MD, NJ, A&L, Agrico) will not go to a zero recommendation, but encourage use of starter fertilizers, while others (DE, SC, WV, Va, NC) do not recommend P at high to very high levels.
4. Potassium: Good agreement between labs for analysis and recommendations with two exceptions. DE generally recommends less K than other labs because of belief that subsoil K will be of considerable value in meeting crop needs. Agrico's recommendations were much higher than all labs, because they include crop uptake and soil build-up. Many questions were raised about the value of this approach, particularly on sandy coastal plain soils where it is often very difficult to increase levels of K in surface soils.
5. Sulfur: Brookside reported good success in using the Mehlich III (M3) as a sulfate-S extractant. This was encouraging to labs with ICPs who are considering

switching to M3.

6. Manganese: DE now using Mn availability index, based on research conducted by Fred Cox and Dave Martens, and includes Mn, Zn in routine test. Most states agree that this approach essential and that in many cases pH is more important than extractable Mn. NC reported that if labs convert to M3 must use plasticware to prevent Mn adsorption by glass extracting vessels; also reported that all Mn standards should be made in plastic as the use of glass volumetric flasks can rapidly and seriously reduce solution levels of Mn in standards.
7. Zinc: DE now basing zinc recommendations on soil test Zn, pH and extractable phosphorus.
8. Boron: VA reports that the M3 extractant may be as good as hot-water soluble B. However, most states have little faith in value of soil testing for B, preferring plant analysis instead.

Review of N, P, K recommendations and critical levels

All states brought copies of their fertilizer recommendations and currently used critical levels. Steve Donahue discussed the original efforts by members of MASTWG to agree on extractable (Mehlich 1) levels of P and K beyond which no further crop response would be expected, and the levels at which no further fertilizer would be recommended. The difference between the two values was viewed as a safety margin in fertilizer recommendations. The group had no evidence to support the need for any change in the soil test level of *no further crop response*. Discussion centered on currently used critical levels which seemed relatively uniform among labs (see enclosed summary). Differences in fertilizer recommendations at the various levels (based on discussion and prior sample exchanges) seemed to be narrowing among labs. Sims pointed out a recent article in Agricultural Age that criticized labs for making very different recommendations based on same analysis. Consensus was that this was an unfair assessment of the recommendations made by most university and state labs.

Changing fertilizer recommendations based on yield goals and tillage practices

Most states use some form of yield goal in making fertilizer recommendations. An example is DE which establishes a yield goal based on soil type and irrigation use. Once yield goal is determined N, P, and K rates are varied accordingly. Another approach, used by MD and WVA, involves establishing a yield goal (e.g. 100 bu/a for corn), making a standard recommendation for all soils, and then recommending an increase in N-P-K (e.g. 12-6-8 lbs/a

of N, P_2O_5 , K_2O) as growers' estimated yield goal increases. Question was raised as to whose yield goal should be used: the growers or the laboratories? Penn State uses growers' yield goal in making recommendations, but if the growers yield goal deviates too far from the Penn State goal (based on soil productivity class), a warning statement is included on report. Consensus of group was that critical soil test level (point of no further crop response) did not change as yields increased, but that crop uptake/depletion was greater so additional fertilizer should be recommended as yields increased to compensate for this.

The only laboratory that is currently altering fertilizer rates based on tillage practices was MD, which reduces P_2O_5 recommendation in no-tillage (based on 0-2" sample) by about 20-40 lbs/a, based on soil test level. MD changed recommendation this year based on data that showed greater efficiency of recovery of P in no-tillage.

March 5, 1987

Conversion to the Mehlich III Extractant

Sims distributed two handouts concerning conversion to M3: (i) A summary of the activities of MASTWG in this area since 1982 and (ii) A report detailing correlation studies currently underway at DE designed to develop conversion equations that would allow utilization of M3 extractant with M1 crop response data base. Donahue stated that ability to use M3 for boron and sulfur was significant advantage particularly for labs with ICPs. Tucker stated that NCR-13 members were also involved in comparison studies between M3 and extractants used in their region. The laboratories currently using M3 are NC, Agrico, Oklahoma, Kentucky, Brookside and Arkansas. NCR-13 members, and those in newly formed Northeastern Soil Test Committee are very interested in use of M3. Consensus of group was that we should prepare a policy statement by MASTWG on conversion to M3 which could then be discussed at individual state/university labs. Sims, Donahue and Tucker will work on summarizing data and prepare a statement for consideration at next year's meeting.

Changes in Laboratory Procedures

NC: New information sheets, modified fertilizer recommendations for lawns. Campbell discussed new equipment (ICP, microwave for plant digestions) for plant analysis laboratory.

MD: Changed to paper bags because many growers prefer them to cloth. Revised routine test to include calcium and organic matter. Changed to multiple sample information sheet (one sheet per four samples). Revised micronutrient test to include Mn, Cu and Zn for one

price.

DE: Manganese and zinc now part of routine for commercial crops. Have almost completed computerization of lab. Will have AA, pH meter and colorimeter connected directly to microcomputer.

GA: Have almost completed new plant analysis handbook which includes more crops. Will distribute to MASTWG members when finished.

A&L: Have linked individual instruments to Apple computers. Data from these computers can then be transferred via disk to a main lab computer for transmission over phone lines.

Agrico: Completely computerized.

VA: Discussed soil test package information sheets, report forms, etc. Presented data from ICP precision study, now running 120 samples per hour. Have computer links with all county offices which can receive and print out current or previous soil test reports. Hawkins discussed use of plant analysis and growth stage analysis to determine N requirements of wheat. Also raised questions about residual soil N from previous fertilizer applications, wondering if we really take this into consideration adequately?

1988 Meeting Plans

1. The 1988 annual meeting will be held on February 17-18. Southern States will again serve as host.
2. Sims will remain as chairman for 1988.
3. Virginia will handle the sample exchange which will rotate among labs in the future according to the following schedule:

1988	Virginia
1989	New Jersey
1990	South Carolina
1991	Delaware
1992	Agrico
1993	Maryland
1994	North Carolina
1995	West Virginia

J. T. Sims
3/23/87