Agricultural and Environmental Services Laboratories

Providing analytical services in the areas of soil, plant, feed, water and environmental samples.

In This Issue

Maintaining Sound Programs and Developing New Ones
- by Dr. David E. Kissel

NIR, A Lower Priced Alternative to Forage Quality Testing
- by Dr. Paul F. Vendrell

New Water Test Package
- by Dr. Paul F. Vendrell

BURIED
- by Jeannie Dawson

New Data Transfer Program
- by Rick Hitchcock

Sample Bottles for New Ga Expanded Water Test (W-2) and for Lagoon Samples

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Maintaining Sound Programs and Developing New Ones –by Dr. David E. Kissel

Our responsibility at the Agricultural and Environmental Services Laboratories is to provide the best possible test results from our well-established testing programs. As a university laboratory, we have the added responsibility of developing new testing procedures and services through collaboration with research and extension programs at the University. This issue of the Tri-Lab news addresses both of these responsibilities. One article provides information on how you can help us to provide the best possible service from our soil analysis program. We also describe new tests for forages and water, as well as new computer software for county offices to provide information to clients.

The new Data Transfer program is now running in 105 of our counties and it will soon be sent on CD to the remaining counties for installation on their computers. In this issue, Rick Hitchcock outlines some of the features of the new program. It is a powerful tool that should help you in the delivery of test results and their interpretation to your clients. In addition to the new Data Transfer, the CD also has a new and improved version of UGFertex, developed jointly by Dr. Owen Plank, Rick Hitchcock, and Dr. Glen Harris. The new version provides identical recommendations as the Data Transfer that you are using in your offices, but it provides some additional capability. With the new version, it recommends both manures and commercial fertilizers to meet crop needs for nutrients. If the rate of manure to be applied does not supply all of the N, P, or K for the crop, then the program calculates the amount of commercial fertilizer needed, so that the correct amounts of both are recommended to meet the crop’s nutrient requirements. The new UGFertex also provides an assessment of the amount of P and K fertilizer needed for building soil fertility to selected levels.

As indicated in the article by Jeannie Dawson, by the end of March we had received approximately 8,000 more soil samples this year than last. This puts a heavy workload on our staff, but they have been able to provide results within two days in spite of this. There are problems that county offices can help us with, and Jeannie outlines those in her article.

Dr. Paul Vendrell describes two new tests from our laboratories. The first of these is the new Expanded Water Test. It is a more comprehensive test than the basic water test and it is especially useful for assessing the need for household water treatment. The second test described is for measurement of forage quality by the new Near-Infrared Reflectance Spectrometer. In order to encourage the use of the new forage tests, Dr. Vendrell is working closely with two new specialists in the Department of Crop and Soil Sciences, Dr. John Andrae and Dr. Robert Morgan.

As always, we appreciate your help and constructive support of the Agricultural and Environmental Services Laboratories.
NIR, A Lower Priced Alternative to Forage Quality Testing—by Dr. Paul F. Vendrell

A Near-Infrared Reflectance Spectrophotometer (NIR) now complements the instrumentation of the Feed & Environmental Water Lab. Compared to the traditional “wet chemistry” methodologies for measuring protein and fiber this new instrument performs measurements with similar quality, faster, with less labor, with fewer supplies and no hazardous chemicals. What this means to our clients is that we can now offer a less expensive alternative to our traditional forage testing packages.

We believe it to be essential that forage producers know their forage quality to improve forage management and animal performance. Our inspiration for installing this new NIR is to provide a cost-effective way to monitor forage quality.

In conjunction with this new instrument, a new employee with NIR experience was hired at the Feed & Environmental Water Lab to develop Georgia-specific calibration equations for forage. We have completed these calibrations and are ready to provide NIR testing. To introduce these new tests, starting May 1st and for a limited time, we will do a complimentary NIR analysis for anyone using our traditional services (F1, F2, or F10) for their forage testing. This will allow clients to become familiar with this new service and compare results.

The NIR has applications other than feed and forage testing. Several research efforts are underway to investigate our ability to measure properties of soil, animal waste, and feed ingredients.

New Water Test Package—by Dr. Paul F. Vendrell

The Agricultural and Environmental Services Laboratories (AESL), in support of Georgia’s Cooperative Extension Service, conduct a water-testing program for household wells. In this program a “Basic Water Test” is offered that consists of pH and a suite of metals. In a review of over 8,800 of these tests done during an eight-year period from 1992 through 2000, the most common problems were low pH and high iron levels. Approximately 30% of the wells tested had pH levels below the recommended minimum of 6.5. The next most common problem was that 17% of the household wells tested had iron levels above 0.3 ppm, the staining level. As a consequence of pipe and fixture corrosion caused by these low pH levels and other related water properties, about 500 samples had copper levels above 1.0 ppm. EPA has found that copper levels above 1.3 ppm may cause stomach and intestinal distress, and that long-term exposure above this level may lead to liver and or kidney damage, and anemia.

To accurately predict the corrosion caused by water and to help design treatment systems to reduce corrosion, more testing information is needed than our “Basic Water Test”
(W1) provides. The corrosiveness of water is determined by pH, alkalinity, specific conductance (dissolved solids), and hardness. We use this information to calculate a Saturation Index (SI) to estimate whether the water is corrosive, scaling, or balanced. “Scaling” is the opposite of corrosion and happens when high pH water contains alkalinity and hardness. This problem initially appears in the hot-water heater. “Balanced” would indicate neither corrosion nor scaling problems.

In order to provide a more comprehensive water test package, we have designed and now offer an “Expanded Water Test” (W2). This test package includes all the measurements needed to calculate the SI described above, along with some additional parameters that are good for tracking the general well-being of your household well. These additional parameters are also useful when designing systems for removing high levels of iron and manganese. It’s also a good idea to have historical levels of nitrate, sulfate, chloride, fluoride, and silica for your well. In the event that you notice a gradual or abrupt change in your water, you can test again and changes in these levels could help indicate problems and potential causes such as:

- nitrate from wastewater, animal waste or fertilizer,
- sulfate or chloride from wastewater or animal waste, or
- chloride from salt water intrusion.

Anyone with either a new or older well is encouraged to take advantage of this new test. Those with new wells are advised to wait until your well has stabilized from the drilling process and has been pumped for approximately 6 months before testing. If there is an obvious problem this waiting period can be shortened by pumping more water from the well.

BURIED by Jeannie Dawson

Whew!! From January to March the Soil Lab (STL) has experienced a significant increase in the number of soil samples received and processed. The STL has processed approximately 8000 more soil samples than the same time period of the previous year. This creates a real challenge to maintain the turnaround to which the counties have become accustomed.

In order to provide the continued accuracy and speed at the preferred level it becomes even more important that county office staff follow the proper procedures for submitting samples. We strongly encourage everyone in your office that may be involved in submission to become familiar with the current Fee Schedule Notebook (last updated Oct., 2001). This notebook contains useful information concerning fees, sampling techniques and the proper forms to use for submission. If you have any questions, just give us a call and we’ll be glad to help you with any problems.

Speaking of “problems,” we have experienced a few of which we need to make you aware.
**Samples too wet to send**  The sample bags have broken open and spilled the soil within the shipping box. Not only does this lose the sample, it can make it impossible to read the writing on the other bags giving us no way to identify the samples left intact. Please inform your clients that wet samples should be air-dried before being shipped. There have been boxes received thru UPS that had broken apart from the moisture of the samples enclosed. When the bags leave a water spot on a table, they are too wet to send.

**Forms not enclosed with samples**  With the large numbers of samples that we receive, it takes many hands to get them processed in a timely manner. If the forms aren’t with the samples that are listed, it creates a bottleneck in the logging-in process. In some cases we have just placed the box aside until we have the time to track down the proper form. This can delay the return of your results.

**Not enough sample**  There is a dotted “fill line” on every sample bag. Keep in mind that “results are only as good as the sample.” Just a little bit of sample in the bottom of the bag is not a representative sample. We have to dry and grind each sample. We cannot recover the entire sample when we grind them; so many times there is an insufficient amount to analyze. If the sample size is not sufficient, you should ask the client to bring in enough to get the best results.

**Samples not listed**  We know that this is your busy time of year for soils. But multiply that by 159+ county offices to get an idea of what we experience in sample load. It is always a good idea to count the number of bags you’re sending and the number of samples listed to avoid leaving samples unlisted or possibly listing samples more than once. This can also add to the delay of results. Samples that are not listed are put aside until someone has the time to make a phone call and/or fill out the proper paperwork.

These are the primary situations that we have experienced this year with a few other minor ones that we are continuing to address with individual counties. If you have new or temporary employees helping you, point out the list of instructions at the bottom of each soil submission form. By following these guidelines, soil submission errors can be kept to a minimum; thus contributing to a smooth and efficient operation in your office and ours.

We appreciate your continuing cooperation in helping us provide you the best service possible.

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**New Data Transfer Program by Rick Hitchcock**

As many of you are aware, a new version of Data Transfer is now available. Counties running Windows 98 have received instructions for downloading the update; 105 counties are now running the new program. Counties still running Windows 95 will need a CD installation; we are now in the process of distributing those CDs. Eventually, all the counties will receive the CD installation, so those of you already running the program will be able to install it to other machines in your office.
Features of the new version include:

1. Filling in and printing Submission Forms from your computer

2. Downloading analysis results for Poultry Litter and other Animal Waste samples

3. Printing envelopes: as part of this new feature, you'll also be able to edit names and addresses in case we have an error in data entry.

4. Your county's phone number will now print on all reports

5. Previewing reports

6. Printing to any graphics printer, even over your network

7. PDF reports: you will now be able to e-mail results to your clients.

8. Integrated browser in program:
   Instead of (1) loading Netscape, (2) finding your Data Transfer bookmark, and (3) entering your username and password; you will (1) load Data Transfer, and (2) click "Download New Results." Your username and password will be automatically entered for you. This also means you won't need to install Netscape on new computers just to be able to run Data Transfer.

   Documentation is found on the Help menu: "Tour of Data Transfer." You'll probably be comfortable downloading and printing routine results without referring to the documentation; but it also contains useful information you may find handy, such as how to print reports for a single individual, and how to copy and paste data between Data Transfer and Excel.

If you have any questions about the update, just contact Rick Hitchcock or David Jennings at:

soiltest@uga.edu

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Sample Bottles for New Ga Expanded Water Test (W-2) and for Lagoon Samples

New pint-size sample bottles and mailers are available from Hal King at Extension Supply (706 542-8844) or by e-mail esupply@arches.uga.edu. Please request the narrow-mouth bottles for the Ga Expanded Water Test (the W-2 test) and the wide-mouth bottles for lagoon samples. These bottles are expensive and our storage space is limited; therefore, please request only the number of these bottles that you need for client samples for the upcoming three months.