

65th Anniversary of N.C. Soil Testing Service

Agronomic Division — 2005 Annual Report Colleen Hudak-Wise, Ph.D., director, (919) 733-2655

This year marks the 65th anniversary of North Carolina's soil testing service. Today, soil testing is still the primary focus of the Agronomic Division though not its sole mission. The Division's current scope is broader to better meet the needs of North Carolina's diverse agricultural, business and residential communities. Field services, nematode assay and plant/waste/solution analyses, in addition to soil testing, help the division meet its mandate to enhance plant growth, productivity, profitability and environmental quality.

For the first time in 16 years, the N.C. Board of Agriculture approved fee increases for some agronomic testing services, effective September 1, 2005. The increases will affect fees for nematode assays, plant tissue analyses, waste analyses, solution analyses and tests for heavy metal content in soils. The fees paid by North Carolina residents for most agronomic tests will be only \$1 higher, but more substantial fees will be charged for special tests and for the processing of out-of-state samples. Routine soil tests will continue to be free.

Service

In fiscal year 2004–05, Agronomic Division laboratories processed more than 380,000 soil, nematode, plant, waste and solution samples, and issued more than 55,000 advisory reports. This workload represents an increase of about 32,000 samples over last year, probably due, in large part, to implementation of the revised Natural Resources Conservation Service (NRCS) 590 Nutrient Management Standard and the new N.C. Phosphorus Loss Assessment Tool. The soil testing and waste analysis laboratories continued to operate under the N.C. Department of Environment and Natural Resources (DENR) Division of Water Quality's laboratory certification program and are qualified to provide critical testing for animal waste permits and nutrient management compliance. The plant analysis laboratory joined soil testing this year in participating in the North American Proficiency Testing program. Under this program, our laboratory results are compared with those of other laboratories across the country on a quarterly basis.

Technical staff provided about 6,300 farmers, homeowners and agribusiness leaders with technical advice and recommendations for efficient crop fertilization, plant nutrition, biosolid land applications and effective nematode management. Above and beyond their normally assigned duties, 6 of the division's 13 regional agronomists spent most of June through August serving as regional coordinators for the department's field verification of agricultural losses occurring as a result of 2004 hurricanes. Other division staff also volunteered days and weeks of their time to this effort.

Regional agronomists responded to hundreds of requests regarding environmental issues — primarily waste management plan clarifications, regulatory updates, and river basin oversight reviews — and participated in local advisory committees. Agronomists also provided technical expertise, service, and/or training for several regional and statewide environmental projects in cooperation with DENR, North Carolina State University (NCSU), N.C. Agricultural & Technical State University and USDA-NRCS.

The **Soil Testing Section** analyzed 313,648 soil samples and supplied lime and fertilizer recommendations through 37,000 reports, in what turned out to be the second highest sample volume in the state's 65-year history of soil testing. Turn-around time never exceeded six weeks and, for much of the peak testing period, samples were processed in about four weeks.

The laboratory continued to pursue improvements in functionality and efficiency of equipment and lab space. An automated humic matter station was made fully operational; bulk chemical tanks for mixing and storage of large volumes of solutions were purchased; three reciprocating shakers for soil extraction were purchased; and two additional pH stations were made operational. Additionally, the section purchased an automated segmented flow analyzer that enables the lab to analyze nitrate, phosphate and sulfate. This addition facilitates more timely nitrate analysis and makes it possible to carry out special analyses for research purposes.

Lastly, the section said good-bye to Mr. Roger Jones who completed 34 years of state service. Mr. Jones spent his career working as an Agricultural Research Assistant I in the soil lab. His loyalty to our division and dedication to service have been greatly appreciated.

The **Plant/Waste/Solution Section**, under the direction of Brenda Cleveland since December, analyzed 12,189 plant tissue, 19,207 waste, and 2,385 solution samples. The laboratory installed two new fume hoods and a muffle furnace in the sample digestion room. These changes are improving productivity and increasing worker safety.

Dr. Weimin Ye assumed leadership of the **Nematode Assay Section** in October following the retirement of Dr. Jack Imbriani. The lab processed 34,401 samples in fiscal year 2005, including 188 diagnostic samples from the Plant Disease and Insect Clinic at NCSU and 1,382 regulatory samples from the NCDA&CS Plant Industry Division. Dr. Ye has already set up a new database that will enable the division to take a closer look at crop nematode associations and problems throughout the state.

Education

Agronomic Division staff, especially the **Field Services Section**, reach thousands of growers, homeowners and agricultural professionals through a wide range of educational activities. Staff conducted 21 laboratory tours for farmers, master gardeners, agribusiness groups, scientists and students, including a 47-person delegation from Honduras. Information on agronomic services was disseminated through 39 educational exhibits displayed at farm shows, field days, training events, professional meetings and symposia.

Outreach also included at least 4 radio interviews and 20 news releases in addition to articles in publications such as *Turf* magazine, *North Carolina Turfgrass*, the N.C. Vegetation Management Association newsletter, the Philip Morris newsletter and *The Strawberry Grower*. Many presentations on agronomic services were made to master gardeners, growers, commodity associations, conservation groups, and county and state organizations.

Division staff authored or collaborated on eight technical publications. Division brochures on soil testing, heavy metals, and accessing agronomic reports online were revised and updated. Dr. David H. Hardy collaborated with NCSU soil science professors on a corn fertilization

poster, which won a blue-ribbon in the Educational Materials category at the American Society of Agronomy's 97th annual meeting in Salt Lake City.

Safeguarding environmental quality continues to be a top priority. In 2005, staff cooperated with the following agencies to provide information related to biosolid land application and training in use of agronomic services, proper sampling techniques, and common soil and crop fertility problems:

- DENR — spray irrigation and biosolid application schools;
- NCSU — nutrient management training for certified technical specialists.

Division staff participated in local, state, regional or national meetings, including

- Soil Science Society of N.C., 48th annual meeting (Raleigh; January 18–19 2005)
 - presentation: *Changes in soil test phosphorus relative to dynamics in N.C.*
 - poster: *Comparison of sidedress N placement to improve N-use efficiency for no-till corn;*
- Turfgrass Council of N.C.'s Demo Days (Hickory & Goldsboro; March 9–10, 2005)
 - presentation: *Tissue & water testing for golf course managers*
- N.C. muscadine grape growers' meeting (Pine Level; August 2005)
 - presentation: *Tissue sampling and fertility management for muscadine grapes;*
- N.C. Greenhouse Vegetable Growers' Association meeting (Raleigh; October 25–26, 2005)
 - presentation: *Plant tissue sampling in greenhouse vegetables;*
- USDA-NRCS conservation tillage meetings (October 27 & November 3, 15, 16, 2005)
 - presentation: *Agronomic Division update;*
- American Society of Agronomy, 97th annual meeting (Salt Lake City, UT; November 2005)
 - poster: *Sidedress fertilizer placement for most efficient nitrogen use in no-till corn;*
- N.C. Wildlife Resources Commission meeting (Fort Fisher; December 1, 2005)
 - presentation: *NCDA&CS recommendations for fertilization of wildlife food plots;*
- Southeast Vegetable & Fruit Expo (Myrtle Beach, SC; December 12–14, 2005)
 - presentation: *NCDA&CS services for greenhouse vegetable production.*

Research

Agronomic staff routinely conduct studies with university personnel, farmers and industry specialists. The laboratories processed 8,920 soil samples, 5,340 plant/waste/solution samples and 2,329 nematode assays for cooperative research.

The soil testing section initiated an ongoing greenhouse study with Dr. Eric Hinesley of NCSU to determine the optimal soil pH for growth of leyland cypress. Leyland cypress production is increasing in the state, and there is interest in marketing them as table-top Christmas trees. Investigations were also begun into ways to effectively lower soil pH at sites where it is significantly elevated.

Regional agronomists conducted about 12 research and demonstration projects in fields throughout the state. These projects were designed primarily to optimize fertilizer rates, waste utilization, sampling procedures and use of organic material as nutrient sources.

During 2005, staff conducted specific field studies on

- comparison of manganese sources under high pH conditions,
- use of plant tissue analysis to assess tobacco leaf quality and ripeness,
- root-knot nematode management with nematicides and amendments,
- evaluation of new nitrogen forms on cotton and corn,
- potassium and calcium interaction on peanuts,
- zinc toxicity on peanuts and
- potassium fertilization in blueberry production.