

## **Agronomic Division — 2003 Annual Report**

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North Carolina is losing some of its best and most productive farmland at an increasingly alarming rate, increasing the need to improve crop productivity and efficiency on remaining acres. The pressure to increase productivity must be balanced with careful environmental stewardship. Proper nutrient management using science-based agronomic principles and technologies is helping growers make informed decisions that will preserve and protect our natural resources.

For these reasons, thousands of North Carolina residents continue to use the analytical and advisory services provided by the Agronomic Division to enhance plant growth, agricultural productivity and environmental quality. With increased emphasis on improving nutrient management, protecting water resources and developing new agricultural enterprises, agronomic services are more important than ever.

### **Service**

In fiscal year 2002-03, the laboratories processed more than 320,000 soil, nematode, plant tissue, waste and solution samples, and issued more than 50,000 advisory reports. Workload was lighter than usual this year due to excessive rainfall that made collection of field samples difficult. The soil testing and waste analysis laboratories continued to operate under the N.C. Department of Environment and Natural Resources Division of Water Quality's wastewater certification program and are qualified to provide critical testing for animal waste permit compliance.

Specialists and field staff in the division provided about 10,000 farmers, homeowners and agribusiness leaders with technical advice and recommendations for efficient crop fertilization, plant nutrition, biosolid land applications and effective nematode management. Regional agronomists throughout the state conducted on-site assessments for growers; assisted with land management and plant growth problems; and counseled producers on using proper fertilizers, saving money, and implementing nutrient management plans. Several staff also assisted with Hurricane Isabel emergency-response efforts.

Regional agronomists responded to hundreds of requests regarding environmental issues — primarily waste management plan revisions or clarifications, regulatory updates, and river basin oversight reviews — and participated in local advisory committees. Agronomists also provided technical expertise, service, or training for several regional and statewide environmental projects in cooperation with DENR, N.C. Department of Transportation, N.C. State University, and USDA Natural Resources Conservation Service (NRCS).

The soil testing laboratory analyzed more than 252,000 samples and provided fertilizer and lime recommendations for more than 100 crops. Recently, soil test crop codes and recommendations were revised to meet changing needs and interests. New codes for forage crops such as switchgrass and wildlife foods were created. Crop codes for vegetables with

similar recommendations were combined and a few crop codes were deleted due to lack of use. These changes necessitated the revision of the sample information sheet.

The lab is preparing to increase its efficiency and capacity by 10 percent through a grant from the USDA-NRCS. Officials anticipate an increase in sample volume due to implementation of the revised NRCS 590 Nutrient Management Standard and the new N.C. Phosphorus Loss Assessment Tool. This grant provides funding for new analytical instrumentation, an automated humic matter station and additional labware to support increased sample volume.

The soil testing laboratory continued to participate in the North American Proficiency Testing Program administered through the Soil Science Society of America and American Society of Agronomy. Dr. David Hardy, soil testing section chief, was elected to a three-year term as an officer on the Soil and Plant Analysis Council. The officers of this council represent educators, scientists and industrialists worldwide who are committed to advancing nutrient analysis of soil, plant, water and manure.

The plant/waste/solution laboratory analyzed 16,655 plant tissue, 18,713 waste, and 2,202 solution samples. The laboratory upgraded its equipment for determining nitrogen components in liquid waste and solution samples. The new digital system facilitates equipment calibration and programming that helps ensure a higher level of quality control. These and other changes improve productivity and increase worker safety.

Of the 30,911 samples processed by the nematode assay laboratory, 150 were diagnostic samples from the Plant Disease and Insect Clinic at NCSU and 343 were regulatory samples for the NCDA&CS Plant Industry Division. Given the potential for nematode damage, most major crops in North Carolina are undersampled. Soybean cyst nematode is the number-one disease problem in soybean, yet less than 11 percent of soybean acreage is sampled for this pest. Growers of cotton, sweetpotatoes, tobacco and vegetable crops continue to be the primary beneficiaries of this valuable service.

## **Education**

Agronomic Division specialists and regional agronomists reach thousands of growers, homeowners and agricultural professionals through a wide range of educational activities. Staff conducted 18 laboratory tours for students, farmers, master gardeners, agribusiness groups and scientific visitors from out of state. Information on agronomic services was disseminated through 33 educational exhibits displayed at farm shows, field days, training events, professional meetings and symposia.

Outreach also included 21 news releases, radio and television interviews and 48 presentations on agronomic services to master gardeners, growers, commodity associations, conservation groups, and county and state organizations.

Division personnel authored or collaborated on 21 technical publications. Staff developed a series of fact sheets describing how agronomic services meet the needs of specific commodity groups including Christmas tree growers, nursery producers, tobacco farmers,

vegetation management specialists and wildlife resources personnel. Staff also published a new informational leaflet on “heavy metals” in soils, a topic of increasing environmental concern. In cooperation with NCSU, the division provided significant technical assistance in preparing a new brochure “Chemigation and Fertigation” and helped educate farmers on sulfur deficiencies caused by heavy rainfall. A “Pictorial Guide to Plant Tissue Sampling,” which includes sampling guidelines and photos for nine major crops, was added to the division’s Web site.

Safeguarding environmental quality continues to be a top priority. In 2003, 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;
- Plant Food Association of N.C. - school for operators of fertilizer spreader trucks;
- DENR, Solid Waste Division - septage schools in Greensboro, Morganton, Williamston, Bolivia and Mooresville.

## Research

Agronomic staff routinely conduct studies with university personnel, farmers and industry specialists. The laboratories processed 4,712 soil samples, 7,023 plant/waste/solution samples and 2,096 nematode assays for cooperative research. Regional agronomists conducted about 60 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.

The division continued to participate in a multi-agency work group to develop and field test the Phosphorus Loss Assessment Tool. Farms with new or revised comprehensive nutrient management plans will soon be required to assess phosphorus loss from fields to improve phosphorus recommendations and utilization.

During 2003, staff conducted specific field studies on:

- comparison of manganese sources for increased cotton production;
- effects of high soluble salts on small grain crops (as related to hurricane aftermath);
- plant tissue analysis to assess tobacco leaf quality and ripeness;
- production of organic tobacco transplants;
- fertigation of trellis tomatoes grown under plastic;
- role of nitrogen fertilization in sweetpotato production;
- plant tissue sufficiency range recalibration for bunch grapes;
- root-knot nematode management with fumigants and amendments;
- soybean cyst nematode management with resistant crop varieties and/or a nematicide;
- sting nematode management on bermudagrass;
- chemical management of lance nematodes on soybeans;
- root-knot nematode management on tomatoes grown under plastic.