

Project Title: Soil Fertility and Nutrient Management

Project Leader: Tracy Allen

Project Overview

Vigorously growing plants require adequate, but not excessive, essential nutrients. Nutrients must be provided in the right form, at the right time, and at the right place. Management of all nutrients sources (i.e., soil, commercial fertilizer, compost, and animal and green manure) within the constraints of the production system is fundamental to both economic viability and environmental quality. Poor management of plant nutrients can lead to economic losses and environmental degradation of soil, air, and water quality.

The overall objective of the Soil Fertility and Nutrient Management project is to develop and promote practical, innovative, and affordable solutions to existing and emergent issues related to soil fertility and nutrient management in the Commonwealth and beyond. This is accomplished through applied laboratory and field research used to support ongoing extension and outreach activities. The primary outreach vehicle for the project is the University of Massachusetts Soil and Plant Nutrient Testing Laboratory.

The University of Massachusetts Soil and Plant Nutrient Testing Laboratory offers accurate and affordable analytical testing of nutrients in soils, plant tissue, and soilless greenhouse media. We also offer analysis of heavy metals in soil, compost, and other planting media. The lab promotes sustainable management practices by providing research-based interpretation of analytical results, and fertilizer and lime recommendations. These services help clients manage soil and soil amendments more profitably while protecting environmental quality. Lab clientele include backyard gardeners, green industry professionals, and commercial growers, as well as engineers, crop consultants, and research scientists.

Activity Summary 2020

- **Analyses** - Order forms and information are obtained on our website: <http://ag.umass.edu/services/soil-plant-nutrient-testing-laboratory>. The vast majority of orders received come to the lab via USPS, UPS and FedEx. Only a small percentage of clientele come to the lab to drop off samples. Test results are returned via email and/or mail. There is no way for us to quantify demographics. (11070)
- Disseminate practical and applied information through direct consultations – via email, telephone and in person (800)
- **Fact Sheets** – Links to relevant fact sheets are available to the general public on our website. (35910)
- **Web Services** -This data comes from Google Data Analytics. Pageviews were reported as the Number of outputs completed, and Entrances were reported as Audience Numbers. It isn't known how many individuals visited the website (<http://ag.umass.edu/services/soil-plant-nutrient-testing-laboratory>). There were 46796 Unique Pageviews according to this report. (34472)

	Adult Contacts
Direct Contacts	
Indirect Contacts (Print, Web, etc...)	74189

Narrative Summary and Impact

When FY20 started, we were hopeful about building the lab's trust fund, and perhaps acquiring much needed equipment. We researched options for a new CN Analyzers and we met with two representatives from manufacturers of these types of instruments. We were hoping to expand our current services to include Total Carbon and CN Ratio for soils, compost, and other planting media.

In February, interviews were held for a Lab Technician 1 position (to replace the Chemist 1 position vacated in FY19). That position was filled on March 9, 2020. A seasonal Departmental Assistant position was posted on the Human Resources website to replace the Technical Assistant position that was slated to end on July 2. On March 13, 2020, we were informed that the lab would be closed due to the concerns over the spread of COVID-19.

The lab remained closed until June 23rd. During that time, the staff worked remotely on professional development. We held Zoom meetings and communicated via email and Microsoft Teams. Individuals researched topics such as Soil Health, Cover Crops, Invasive Species, and Soil Microbiology. Options for a new ICP spectrometer were investigated. As a group, we studied the Cornell Assessment of Soil Health (CASH) method, as well as NRCS procedures recommended for assessing soil health. We watched videos, read research papers, and searched the internet for relevant information.

As the growing season ended and our volume of samples for analysis dropped off, we turned our attention to completing the documentation of our standard operating procedures for laboratory and administrative tasks. Written procedures had been badly out of date or altogether missing. This documentation is important for training purposes and for ensuring that all lab technicians use the same procedures. At the time of this writing, all lab procedures except one has been written, reviewed, and posted at the appropriate workstation. The plan is for an annual review to take place for each of these documents to ensure accuracy, and to update as needed.

When we were finally able to return to the lab, we had a mountain of packages to process without the aid of student employees. Additionally, we were operating under COVID-19 guidelines, which required us to work split shifts. By mid-July, we were able to accept new samples for analysis, but our Technical Assistant's position had ended, and we were unable to fill the opening due to a UMass hiring freeze. Lab services had to be reduced to Routine Soil Analysis (including optional testing) and Particle Size Analysis only.

The staff was further reduced at the end of August by the retirement of the lab supervisor, leaving three individuals – the lab secretary, head chemist, and newly hired lab technician. We are hopeful that vacancies can be filled before spring 2021.

Collaborating Organizations

- **North American Proficiency Testing**
- **Agricultural Laboratory Program**
- **Northeast Coordinating Committee**
- **Greenfield Community College**
- **University of Vermont**
- **University of Rhode Island**
- **University of New Hampshire**
- **University of Maine**