The Center for Agriculture, Food and the Environment

UMass Extension
Mass. Water Resources Research Center
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Project Title: Soil Fertility and Nutrient Management

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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 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 2019

- **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. (4486)
- Disseminate practical and applied information through direct consultations – via email, telephone and in person (4500)
- **Fact Sheets –** Links to relevant fact sheets are included with most test results. In addition, fact sheets are available to the general public on our website. (20000)

- **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 94239 Unique Pageviews according to this report. (37686)
- **Proficiency Testing -** We participate in two lab proficiency programs. We submit soil data to the North American Proficiency Testing (NAPT) program twice a year, and plant tissue data to the Agricultural Laboratory Program (ALP) three times a year. Test results are compared to lab data collected from all over the country. These programs help us assess the proficiency of our methods and procedures. (2)
- **Workshops** - We hosted three class groups on tours of the lab. Classes were in Viticulture, Organic Vegetable Production, and the UMass Vegetable Winter School. In addition, I was a guest on the Farm to Fork Radio Show in February on Valley Free Radio out of Northampton. Also, I gave a phone interview to Lawn & Landscape Magazine, also in February. The magazine has a print and online version, and is circulated nationally. It is unknown how many people the radio broadcast or magazine article was able to reach (50)
- **Regional Projects** - On January 8, 2019, I met with Katie Campbell-Nelson and Genevieve Higgins from the UMass Extension Vegetable team to discuss findings from the previous year's High Tunnel Project. The project was a collaboration between UMass, the University of Maine, UNH, URI and UVM. It was designed to determine optimum fertility levels, with the goal of developing meaningful recommendations for high tunnel growers.
  Completion of the project is pending. Lime and fertilizer recommendations are needed, and a means of generating results reports need to be developed. Additional funding is needed in order to develop a report generation program. (3)

Total Educational Contacts

	Youth Contacts	Adult Contacts
Direct	50	4652
Indirect		57686

Narrative Summary and Impact

In FY18, we were working on several initiatives aimed at ensuring the lab's future success. First was a plan to identify low-cost and no-cost methods of promoting the lab. In a continuation of that initiative, I was a guest on the Farm to Fork Program for Valley Free Radio, a local radio station located in Northampton, MA. We discussed the benefits of soil testing, and some specifics on information that can be obtained through the lab. In addition, I agreed to an interview with the Lawn & Landscape Magazine, which is a print and online magazine aimed at green industry professionals. The magazine is distributed nationally**.**

Work continued throughout FY19 on development of a system for allowing credit card payment for lab services through the UMass Extension Bookstore. While there has been progress, the new system is not ready for implementation. There is no estimate of when that system will be ready.

In October 2018, we instituted a new fee schedule that was based on the actual cost of running analyses. Sample volume dropped off significantly after posting the new fees, and we have not yet returned to typical sample volumes.

Analysis and data collection for the collaborative High Tunnel Project was completed in early FY19. The plan was to offer services to High Tunnel growers that would compare test results to optimum nutrient levels for these growing systems, as well as to provide lime and fertilizer recommendations to maintain optimum levels. More research needs to be done in order to develop recommendations. Additionally, funds are needed for development of a report generating system for High Tunnel testing.

We had two significant equipment failures that affected our ability to provide services in FY19. In July 2018, one of our fume hoods was deemed unsafe, and was shut down for repairs. Repairs were finally completed in February 2019. During this time period, we were unable to process soils for the Total Sorbed Metals test, and plant tissue samples received had to be sent to another lab for that part of the analysis. In August 2019, our Elementar VarioMax CN Analyzer was down for eight weeks during the peak plant tissue season. Again, samples had to be sent to another lab for Total Nitrogen analysis during that period.

In addition to the lost revenue for samples sent to other labs, there were orders that we had to turn away. Before the CN Analyzer went down, I had posted a new order form offering total carbon / total nitrogen analysis. We had orders from three separate customers requesting this service, but since we had not yet accepted payment, we cancelled the orders. Since the CN Analyzer is 17 years old, this service is not being offered at this time. A new CN Analyzer is desperately needed.

A plan is needed that balances revenue and expenditures that allows for the purchase of new equipment. Additional support and guidance is needed in this area.

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**