Office of the Director • Stockbridge Hall • 80 Campus Center Way • Amherst, MA 01003-9246 • p: 413.545.4800 • f: 413.545.6555 • ag.umass.edu

Title: Sustainable Food and Feed Production

Project Leader: Masoud Hashemi

Project Overview

The crops, dairy, livestock, and equine industries are important economic contributors to the Massachusetts economy, both directly, and indirectly through the services and industries they support. Together the dairy and livestock farmers in Massachusetts manage more than 130,000 acres of hay, pasture and corn, contributing to open space that is important to both non-farm residents and tourism. Massachusetts also has a sizable equine industry with a horse population of more than 45,000, with more than 10,000 horse owners. The UMass Extension Sustainable Food and Feed Production Project conducts applied research and provides educational opportunities and technical assistance to dairy farmers, livestock producers and horse owners to increase their knowledge of environmental issues and their ability to reduce the threat of pathogens and nutrient loss from barns, stables, fields and pasture.

Activity Summary - 2018

- Agronomy Research Reports on Sustainable soil and cropping systems (3)
- Applied research on cover crops for improving soil health and recovery of nutrients (4)
- Applied Research on silage corn for feed - Evaluation of cover crop-corn silage compared to traditional corn silage (3)
- Consultation and technical assistance for Dairy, Livestock Farms and Equine operations in Massachusetts (12)
- CDLE Newsletter (3)
- Fact Sheet Production – Pasture Management (8)
- On-site Research Demonstrations – Best Management Practices for the Equine Industry - The Impact of Equine on the Environment (6)
- Poster and Verbal Presentation at the American Society for Agronomy (4)
- Peer reviewed Scientific Journal Publications (12)
- Workshops for Horse Owners (2)
- Advising graduate students as chair or committee member (4)
- Graduate Committee member for Stockbridge School students (3)
- UMass Crops, Dairy, Livestock, Equine website (1)

Total educational contacts

	Adult Contacts
In Person	4259
Indirect Contacts (Print, Web, etc…)	28000

Narrative Summary and Impact

Sustainable Soil and Cropping project included a variety of research projects at the UMass research farm, demonstration trials at collaborating farms, and presenting results in various ways including field days, twilight meetings, conferences, and workshops. The major focus of all activities has been improving soil health and natural soil fertility through advocating for cover cropping and transitioning from conventional to the no-till cultivation systems. In addition, the project focused on maintaining environmental quality through minimizing commercial fertilizer, manure management through innovative composting systems, and use of cover crops in various cropping systems. The project consisted of 4 major components:

1- Replacing monoculture corn silage with a more environmentally sound rye cover crop/corn silage system to enhance soil health, produce emergency feed, and boosting farmers' income.

2- Introducing several specialty crops including faba bean, kohlrabi, and sunhemp as multi-purpose crops to increase sustainability and resiliency of cropping systems in a changing climate while increasing farmers' gross income.

3- Managing manure in equine operation to minimize negative impact on environment. Through this project, two innovative composting systems were introduced to change the liability of manure into asset. These two systems have drawn international attention. Several inquiries were received from countries including Mexico, Peru, Malaysia, and Australia.

4- A novel approach for replacing the traditional soil sampling protocol is under investigation. Currently 9 dairy farmers in Massachusetts have participated in the project.

Because of this project and with collaboration from NRCS, the number of dairy farms that currently grow cover crops on time to harvest it as a high quality forage in May has been dramatically increased. In addition, the number of farmers that are replacing conventional tillage with no-till system is increasing. Adoption of both practices should be considered as one the major success of the project. The new adopted system results in improving soil health which is foundation of sustainable farming, protects the environment through reducing the application of commercial fertilizer thus protecting the environment, and finally improves the farmers' income.

The introduction of the two composting systems (aerated composting bins and static aerated composting piles) has been a great success. These two systems have been adopted by horse owners as well as other farmers not only in Massachusetts, but has drawn attention and interest nationwide. CDLE team has received hundreds of calls and email about these two composting systems.

With collaboration of several graduate students, several successful applied research trials were conducted. Just in 2018, 12 peer-reviewed manuscripts were published in high impact scientific journals.

Collaborating Organizations

- **SARE (Sustainable Agriculture Research and Education)**
- **MDAR (Massachusetts Department of Agricultural Resources)**
- **NECCC (Northeast Cover Crops Council)**
- **NRCS (Natural Resources Conservation Service)**