

## **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 - 2016**

- Consultation and technical assistance for Dairy, Livestock Farms and Equine operations (120)
- Crops, Dairy, Livestock and Equine Newsletter (4)
- Applied research on silage corn for feed (2)
- Applied Research on cover crops for improving soil health and recovery of nutrients (7)
- On-farm research demonstrations: Best Management Practices for the equine industry (4)
- Presentation at American Society of Agronomy annual meeting (3)
- Publications: the Agronomy Journal and the International Journal of Plant Production (6)
- Serve as Graduate Advisor for Stockbridge School students (4)
- UMass Crops, Dairy, Livestock, Equine website (1)
- Agronomy Research Reports (5)
- Graduate Advisor for Stockbridge School Students (4)
- Fact sheets on different aspects of nutrient management for dairy, livestock farms and equine operations (2)
- Workshop presenting results of on-farm demonstrations and applied research on equine management practices (4)

***Total educational contacts***

	Adult Contacts
Direct Contacts	7280
Indirect Contacts (Print, Web, etc...)	9570

**Narrative Summary and Impact**

Crops, Dairy, Livestock, Equine Team were actively involved in conducting applied research, on farm demonstrations, presenting educational workshops, and publishing the results of the applied research. All of research projects focused mainly on improving sustainability of farming through diversified cropping systems and integrated animal and crop production. The applied research falls into three areas of study which can be summarized as: 1) managing cover crops to improve soil health, 2) building resiliency and sustainability in farming systems in Massachusetts as well as the region to address climate change's influence on crop productivity, and 3) minimizing the impact of equine and livestock on environment quality, more specifically on water resources.

The success of Crops, Dairy, Livestock, and Equine Team, UMass Extension can be expressed in several ways:

**Funding:** Grants: In the last two years we were able to submit and successfully receive funding for our various research and demonstration projects:

1-Reducing Non-Point Source Pollution from Two Equine Facilities through Implementation, Remediation, and Education of Selected Best Management Practices. Mass. Dept. Environ. Protection/EPA. \$189,019.

2- Developing Best Management Practice for Growing Grain Suitable for Malt in the Northeast. USDA-SARE \$177,442.

3- Dual purpose cover crops for grazing season extension, nematode management, and improved resiliency on dairy farms. USDA-SARE \$15,000.

4- Building resilience and sustainability in dairy forage systems in New England. USDA-SARE \$194,161.

5- Integrating no-till and forage radish cover crop for sustainable early sweet corn production. USDA-SARE \$14,955.

6- Fava Beans; a new multi-purpose crop for new England. USDA-SARE \$14,995.

7-Receiving funding from Northeast SARE where success percentage for funding is only 7-8% is a testimony that our research projects are applied and solve real problems, and result in improved environment quality while increasing farmers income.

**Innovations:** A comprehensive research project and outreach program has been planned to investigate and promote integrating cover crops in various cropping systems. Through a tri-state project (ME, MA, VT) we have introduced an applied method to integrate winter grain cover crops which not only increases resiliency and sustainability of dairy operation but also by producing more quality forage viability of dairy farms will be improved. We have been very successful in promoting adoption of no-till systems that protect the soil from erosion and compaction, enhances soil natural fertility, sequesters more carbon into the soil, and conserves more water so crops can tolerate more severe drought periods which farmers have experienced in recent years. Our research project also introduces new crops and cover crops to the region thus farmers have more crop choices to select from that fits better with their rotation system. Recently we have introduced an innovative method of garlic production. In this method, garlics will be planted into standing fava bean fields. Fava bean serves as a cool season cover crop which protects the soil and fixes atmospheric nitrogen and when they winterkilled their nitrogen rich residues will provide nitrogen to sprouting garlics in following spring. We have helped establish Northeast Cover Crop Council which its mission is promoting cover crops, filling the research gaps in various aspects of integrating cover crops into farming system and provide technical assistance to growers all over Northeast U.S.A. though generating extension publications and hands on workshops. Another part of the project is minimizing non-point source pollution in equine operations. The project consist of series of on farm demonstrations about composting horse manure, pasture management, and mud management. Demonstrating sites are used as pilot farms for hands-on educational workshops

**Adoption:** We were able to significantly increase the number of growers in Massachusetts to integrate cover crops into their farming systems.

### **Collaborating Organizations**

- **American Society of Agronomy**
- **Massachusetts Farm Energy Program**
- **USDA Rural Energy for America Program**
- **U.S. Department of Energy Efficiency and Renewable Energy**

