

University of Massachusetts Combined Research and Extension Plan of Work 2021-2025

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I. Plan Overview

1. Executive Summary

The Center for Agriculture, Food and the Environment at the University of Massachusetts Amherst integrates research and applied research with public education and outreach in agriculture, food systems, natural resources and human development at the University of Massachusetts Amherst. The Center is the contemporary standard-bearer of the university's land-grant origins and links the university to communities, citizens and businesses throughout the state. The Center is the organizational home of both UMass Extension and the Massachusetts Agricultural Experiment Station. The Center serves as a portal through which individuals, industries, and agencies connect with university scientists and educators.

The Massachusetts Agricultural Experiment Station is the principal agricultural research unit at the University. The experiment station supports the scientific research of nearly 100 faculty members located primarily within the College of Natural Sciences and several other colleges. The Experiment Station receives significant support through federally appropriated formula funds with competitive research grants from federal and state agencies and private sources serving as important additional sources of revenue.

The mission of UMass Extension is to improve the health, well-being and security of youth, families and communities; conserve and enhance natural resources; and strengthen agriculture and food systems. We fulfill that mission by utilizing the research and teaching capacity of the University of Massachusetts Amherst to generate and communicate knowledge while creating approaches, methods, and tools for solving problems. UMass Extension links the Massachusetts land grant university with a larger community of people in collaborative partnerships to address issues of fundamental importance to the people of Massachusetts, New England, and the nation. UMass Extension addresses public concerns of high priority for the Commonwealth. Part of the national Cooperative Extension System, UMass Extension conducts workshops, conferences, distance education, training events, consultations, and applied research.

An overarching goal for our planned programs is effective integration of basic and applied scientific research with extension outreach, public engagement and education. There is a unique opportunity afforded by having both UMass Extension and the Massachusetts Agricultural Experiment Station situated within the same larger unit. We expect the integration of research to become a guiding principle of the Center for Agriculture, Food and the Environment. We do recognize, however, that there will remain work best conducted as traditional, scientific research, and outreach education that will have value even without integration with research activities. Nonetheless, the integration of research and extension outreach, in which those aspects of work in a particular area are tightly interwoven, and in which those aspects mutually inform and enrich one another, is a strong model and overarching goal for future programing.

The UMass Amherst Center for Agriculture, Food and the Environment advances environmental quality, agricultural sustainability, sustainability of water resources, efficiency of energy utilization, community viability, positive youth development, and the viability of food systems from production to consumption. The Center brings together the work of staff, faculty in academic departments, and external partners and stakeholders to create programs of research, integrated research and extension and educational outreach that address high-priority public concerns. In addition, the Center provides focused educational services to targeted individuals and groups in ways that advance the Center's vision and goals. The Center facilitates mutually beneficial exchange between citizens and the university and supports community access to academic resources.

2. FTE Estimates

Year	1862 Extension	1862 Research

2021	84.0	19.2
2022	84.0	19.2
2023	85.0	19.2
2024	86.0	19.2
2025	87.0	19.2

II. Merit / Peer Review Process

Massachusetts Agricultural Experiment Station

Proposals for funded research projects proceed through different levels of review. In some cases, prospective faculty investigators collaborate with academic department chairs to propose project ideas. Brief descriptions are sent to the Associate Director of the Massachusetts Agricultural Experiment Station who reviews the basic concept to ensure that it is consistent with the priorities and goals of our Center and of USDA/NIFA. Prospective investigators then develop a detailed research proposal that is reviewed by the faculty member's academic department chair and three external (to UMass) disciplinary peers. Reviewers are asked to complete an assessment form with six areas: justification for research; previous work and outlook; goals, objectives and outputs; outcomes/impacts; methods; and evaluation. Reviewers rate the proposal on a 3-point scale (exemplary, satisfactory or unsatisfactory) in each area and use the same scale to assign an overall rating. Reviewers also make additional, specific comments on how to improve the proposal. The Assistant Director of the Massachusetts Agricultural Experiment Station will request any necessary revisions and make sure they are incorporated into the proposal prior to submission to NIFA.

The Director of the Agricultural Experiment Station also solicits research initiatives in specific disciplinary areas or as supplements to existing projects. A recent example is our Call for Summer Graduate Student Support. These are competitive opportunities for which faculty submit proposals that are reviewed by an internal committee composed of faculty and professional staff. The Assistant Director ensures that there is fidelity to the work as it is described in the proposal and that all expenditures are allowable.

UMass Extension

University of Massachusetts Extension continues its long-standing agreement with Extension in Maine, Vermont, and New Hampshire to utilize a four-state, web-based planning and reporting system. The system allows program staff and administrators to access the content of plans in all six states at the organizational level, the team level and for individuals. Regular telephone meetings with planning and reporting leaders offer the opportunity for each of the states to provide feedback on specific programs or on the statewide goals and initiatives. The four original states have agreed to provide periodic formal and informal merit review and feedback for each state as a component of our partnership. The system provides access to each state plan of work as well as team/group plans, allowing for easy sharing of ideas and opportunities for further collaboration.

The Massachusetts legislature established a Board of Public Overseers to provide advice and oversight to UMass Extension. This 15-member board, comprised of representatives of constituent organizations, meets quarterly. Annual review of budgets, activities, outcomes and goals is a major function of this board. The Board is composed of individuals from the following organizations:

- Massachusetts Farm Bureau Federation
- Massachusetts Arborist Association
- Massachusetts Audubon Society
- Massachusetts Forestry Association
- Massachusetts 4-H Foundation
- Massachusetts Nutrition Board
- Massachusetts Commissioner of Agricultural Resources

III. Stakeholder Input

1. Actions to Seek

The Center for Agriculture, Food and the Environment will continue to solicit input from internal and external stakeholders to identify organizational priorities and help us to structure our organization in ways to better serve constituents. Our plan has different components that are designed to obtain feedback at both broad organizational and more specific programmatic levels and will continue to be implemented over a period of several years. We continue to rely on data obtained from a February 2016 web-based survey we conducted with internal and external stakeholders. The survey obtained information on stakeholder opinions and perceptions of the most significant public issues and concerns in seven areas that reflect the priorities and expertise within the Center. The seven assessed were: Agriculture and Food Systems; Commercial Horticulture; Water Resources; Natural Resource Management; Energy Use; Youth Development; Nutrition

Between 2017 and 2020, information obtained from the web-survey was used to guide strategic planning among our Agriculture team whose programmatic focus is on both food and on commercial horticulture. A goal for these planning efforts was to create better alignment between externally identified stakeholder needs and internally capacity. Our Extension Planning team identified and is still working to answer the following key questions

How do we engage our existing stakeholders?

How can we continue to identify and engage new stakeholders, partners and collaborators?

How can we best communicate the value and impact of our work?

How can staff place appropriate limits on the range of activities and areas they work in?

These questions along with our stakeholder engagement efforts will continue in 2021 and beyond. The Massachusetts 4-H Youth Development Program is our next major program to pursue strategic planning. These efforts will include significant engagement with stakeholders and will occur concurrently with our efforts to identify a permanent 4-H statewide program director.

2. Methods to Identify

Approximately six hundred fifty individuals were identified as potential respondents for the 2016 stakeholder survey. The survey was an opportunity to obtain feedback from individuals with some pre-existing connection to the Center, as well as those whose knowledge and connection to our work is less well established. In contrast, we also continue to gather specific programmatic feedback through our formal advisory bodies, and less formally through interactions with our many collaborators and participant groups. These groups are composed primarily of existing stakeholders with whom we have long-standing or well-established relationships. These individuals and groups already possess clear knowledge and understanding of our organization and programs and frequently have expectations that are more concrete. A follow up, internal survey was conducted in 2017 with approximately 25 professional educators from our Agriculture Extension team whose programmatic focus includes both food and commercial horticulture

Respondents to the large stakeholder survey were identified through a review of contact lists maintained by the Center communications office. The list of survey respondents includes approximately 450 internal (UMass campus-based) stakeholders and approximately 200 external stakeholders. A more specific breakdown of the identified respondents is as follow:

- (38) UMass Dean, Department Head or Administrator
- (302) Center Staff and Aligned Faculty
- (119) Other UMass Staff and Faculty
- (203) External Stakeholder

Information obtained from the survey continues to guide a strategic planning process for our organization. The initial focus has been on the Food and Agriculture Extension programs. That effort is facilitated by the Assistant Director of the Center for Agriculture, Food and the Environment who, along with the Food and Agriculture Program Leader convened a leadership group selected to represent individuals from different program areas as well as a balance of both long-term and newer professional staff.

In 2020, strategic planning continued within our 4-H Youth Development Program with the goal of developing a new 5-Year plan. The previous plan was active from 2013 to 2018. A facilitator was hired to gather input from internal stakeholders (4-H professionals and administrative staff). Some information was also obtained from 4-H volunteers; however, a broader stakeholder process for the statewide 4-H program is currently planned for 2021. This will include more extensive input from current stakeholders and also identifying new stakeholders who share an interest in youth development in Massachusetts.

3. Methods to Collect

The web-based stakeholder survey, internal strategic planning efforts, a recent survey and facilitated discussion among our extension professional staff are all mechanisms for engaging stakeholders both internally and externally. Listening session with 4-H volunteers and stakeholders are currently being planned. Additional formal opportunities to obtain feedback occur when UMass Extension convenes the Extension Board of Public Overseers. Our interactions with the Board, while they include programmatic presentations and organizational updates, are designed largely as opportunities for listening to our stakeholder representatives who provide feedback on budgets, activities, outcomes and goals, and future directions. Significant input is also routinely collected at the level of individual projects and specific programs. These include formal opportunities for collecting feedback on specific programs through focus groups, interviews, stakeholder meetings, written or web-based surveys as well as many informal opportunities that transpire during the course of regular meetings, conferences events and presentations.

4. How Considered

The input we obtain from stakeholders is considered in a variety of ways. We continue to use results obtained from our 2016 organizational stakeholder survey to inform subsequent stakeholder engagement efforts at various levels and to inform strategic planning for our organization more generally. An overarching theme for these discussions has been, and will continue to be, how to use limited resources to most effectively address our mission and meet our programmatic goals. It is in this context that our 4-H Youth Development Program is working to identify strategies and plan ways to sustain and improve organizational functions. A major topic identified for these discussions involves engaging our staff, stakeholders and potentially new audiences to understand their evolving needs and maintain their support. A preliminary analysis of 4-H stakeholder information resulted in the following list of trends for future consideration and planning.

- Declining enrollments
- Online learning
- Increasing parent demands
- Educating whole child
- Increasing school enrichment interest
- Increasing role for technology
- Increased access for kids with diverse abilities

These trends will continue to be explored, in the context of results obtained from our stakeholder survey and in future, strategic conversations and we will continue to use formal and informal methods to consider stakeholder input and better serve our external constituents.

The input we receive from our Extension Board of Public Overseers is typically used to inform broad organizational goals, programming priorities and advocacy strategies. More specific programmatic input we receive is directed towards helping us to refine existing programs and identify topics for future efforts that better serve our audiences and constituents. This input is combined with internal feedback we gather from staff, program leaders, department heads and aligned faculty. Center administrators meet two times a month and a major focus of these meetings is to consider this input in ways that allow us to effectively integrate research and applied research with public education, outreach and extension.

IV. Critical Issues

1 Sustainable Agriculture and Food Systems

Description:

Massachusetts is a leader in creating sustainable, local food production capacity. Expanding demand for direct sales, organic production, specialty crops, value-added products and community-supported farms reflect an interest and increasing commitment to local agriculture. At the same time, many residents of the state, especially those with low incomes, have difficulty taking advantage of fresh foods. The Center addresses food security in Massachusetts and the region through research and public education focusing on new production techniques and marketing strategies that protect natural resource systems while ensuring a healthy, fresh and stable supply of food and by providing research-based nutrition education in communities with higher food insecurity.

The primary long-term outcome for our programs focused food on Food Security is that food production and food systems in Massachusetts are increasingly diverse, environmentally sound and economically vibrant. We have implemented programs designed to help our audiences develop knowledge and skills, and subsequently adopt practices that ensure the environmental sustainability and economic viability of food production and food systems in Massachusetts.

Term: Long

Science Emphasis Areas

Sustainable Agricultural Production Systems

2 Climate Adaptation and Education

Description:

Massachusetts citizens must anticipate and prepare for a variety of new challenges associated with climate and weather. Cities and towns must plan for and protect critical infrastructure that is threatened by increasingly extreme and unpredictable weather-related events. In addition, Massachusetts growers must meet the formidable challenges posed by the increasing demand for locally produced food against the backdrop of a changing climate. The Center conducts research and education to support ecologically restorative flood prevention and remediation, and to sustain a vital agricultural sector that recognizes the emerging benefits, threats and opportunities related to climate change.

The primary long-term outcome for our programs focused on Climate Change is that Massachusetts landscapes, farms and natural system are managed in ways that reduce or mitigate the effects or risks associated with future changes in climate or weather. We have implemented programs designed to help our audiences develop knowledge and skills, and subsequently adopt practices that reduce or mitigate the effects or risks associated with future changes in climate or weather.

Term: Intermediate

Science Emphasis Areas

Agroclimate Science
Environmental Systems

3 Sustainable Energy

Description:

The supply and demand for energy has significant implications for the vitality and the sustainability of our regional economy. The cost of energy influences industrial practices, agricultural production, small business and individual consumers. The Center is an important resource for stimulating innovation in energy conservation and alternative and renewable energy sources. Many activities and initiative focused on sustainable energy have become consolidated within a new program known as the UMass Clean Energy Extension Program. The purpose of the program is to provide a resource to reduce market barriers and accelerate the adoption of clean energy for Massachusetts cities and towns, businesses, institutions, farms, low income and multi-unit housing, and others. The program works closely with businesses to assist them in entering or diversify into clean energy

markets. In the past year, our program was engaged by the state energy and agricultural agencies to support the appropriate development of solar on farmland, and particularly the rules pertaining to "dual use" solar installations.

The primary long-term outcome for our programs focused on Sustainable Energy is that Massachusetts businesses, towns and citizens adopt practices that conserve energy and increasingly utilize alternative, environmentally-friendly and renewable sources of energy. Our programs are also designed and delivered to assist our audiences to adopt practices that increase energy efficiency and the use of renewable energy sources.

Term: Intermediate

Science Emphasis Areas

Bioeconomy, Bioenergy, and Bioproducts
Environmental Systems

4 Food Safety and Functionality

Description:

Food borne pathogens account for millions of illnesses and thousands of deaths in the United States each year. The Center helps growers and businesses meet established guidelines for workers and managers in food retail establishments, residential facilities, schools and childcare settings. The Center also supports research on the molecular and structural properties of food and the development of ingredients that improve food texture, appearance, taste and healthfulness. Through research and education, we are helping to discover the health-promoting properties of food components and identifying new technologies and practices that can detect pathogens and limit the incidence of food borne illness.

The primary long-term outcome for our programs focused on Food Safety is that Massachusetts is to ensure the safety of food grown, processed, prepared and consumed in Massachusetts and to reduce the incidence of food borne illness. We have implemented programs designed to help participants increase knowledge and skill and to subsequently adopt practices to avoid food borne illness and control other food safety risks and hazard. Our primary audiences include food producers, food processors and consumers.

Term: Long

Science Emphasis Areas

Food Safety

5 Child and Family Nutrition

Description:

While childhood obesity rates may finally be declining, obesity remains a critical problem nationally and in Massachusetts. Many of the long-term health problems typically associated with obesity in childhood are reversible but can also lead to obesity in adults. The Center conducts research and community outreach to inform policies and deliver programs that increase access to local produce, promote breast-feeding, educate families about healthy foods choices, and the importance of regular physical activity. Nutrition education programs are delivered to families with limited resources through a statewide network of community collaborators, so that healthy habits are established during childhood, reducing the most harmful effects of obesity and leading to healthier and more productive lives.

The primary long-term outcome for our programs focused on Child and Family Nutrition is to help youth and families in Massachusetts to establish healthy eating habits and physically active lifestyles. Many activities are delivered through two federally sponsored programs, Expanded Food and Nutrition Education Program (EFNEP) and Supplemental Nutritional Assistance Program (Snap Ed). Guidelines for these programs ensure that they reach youth and families from communities at increased risk for obesity and poor nutrition. We have implemented

programs designed to help participants increase knowledge and skill to make healthier food choices, to eat better and become more physically active.

Term: Long

Science Emphasis Areas

Education and Multicultural Alliances

Human Nutrition

6 Commercial Horticulture

Description:

Commercial horticulture provides employment opportunities, income, products and services that support our local economies and meet the diverse needs of our citizens. The long-term vitality of this sector of our economy relies on an educated and competent workforce. The Center supports commercial horticulture through applied research and educational programs that help individuals operate businesses and manage landscapes in ways that are economically sound and environmentally sustainable.

The primary long-term outcome for our programs focused on commercial horticulture are to create an educated and reliable workforce that can operate agricultural businesses and manage landscapes in Massachusetts in a manner that is both economically profitable and environmentally sustainable, leading to the long-term vitality of this sector of our economy.

Term: Long

Science Emphasis Areas

Sustainable Agricultural Production Systems

7 Youth Development

Description:

Massachusetts citizens are concerned with preparing youth for the challenges of today and into the future. Young people can only reach their full potential in environments that offer safety, caring adults, and authentic experiences. A statewide network of more than 1,000 4-H volunteers provide leadership training, life-skills development, recreation, and community service opportunities for youth during out of school time that are engaging and educational. Longstanding clubs and camps are complemented by innovative program that respond to a national 4-H mandate for educational enrichment in science and technology.

The primary long-term outcome for our programs focused on Youth Development is to ensure that diverse youth cultivate a set of skills and experiences that are critical for future success and active citizenship. This is achieved through the support and active participation of adult volunteers. We have implemented programs designed to help youth become effective team members, communicators, and leaders. Over time, these skills will help participating youth to be successful academically, in the workplace and as active members of their community

Term: Long

Science Emphasis Areas

Youth Development

8 Environmental Stewardship

Description:

There is a critical need to better understand current threats to water resources, biodiversity and ecosystem integrity. Land use policies that recognize the vulnerability of natural resources as well as our reliance upon them are also essential. The Center plays a critical role in the development and deployment of innovative approaches

and tools that are based on our evolving understanding of ecological and human systems. Scientific investigations are closely interwoven with educational resources that advance disciplinary knowledge, inform policy decisions and promote management practices that protect terrestrial, wetland, aquatic and coastal ecosystems.

The primary long-term outcome for our programs focused on Environmental Stewardship is to develop programs and disseminate resources that enable Massachusetts citizens to make informed decisions and take actions to preserve or enhance the quality of our natural resources and ecosystems. We have implemented programs designed to help participants acquire knowledge and skill adopt practices to protect and enhance natural resources and ecosystems.

Term: Long

Science Emphasis Areas

Environmental Systems

9 Extension and Experiment Station Administration

Description:

The Massachusetts Center for Agriculture, Food and the Environment provides leadership and administrative support services for research and educational programs delivered by the Massachusetts Agricultural Experiment Station and UMass Extension. The Center coordinates faculty research initiatives and provides oversight and supervision in the following priority areas: childhood obesity, youth development, climate change, economic development, environmental stewardship, sustainable energy, food safety and food security. Center administration initiates the required, participatory decision-making and planning needed for the development of policies, processes and strategic initiatives, is accountable for the management and cultivation of resources, is responsible for evaluating the effectiveness of educational programs and for communicating with the public and the university community.

Term: Long

Science Emphasis Areas

Agroclimate Science
Bioeconomy, Bioenergy, and Bioproducts
Education and Multicultural Alliances
Environmental Systems
Food Safety
Human Nutrition
Sustainable Agricultural Production Systems
Youth Development