2017 University of Massachusetts Combined Research and Extension Plan of Work

Status: Accepted

Date Accepted: 06/24/2016

I. Plan Overview

1. Brief Summary about Plan Of Work

In the 2015 Federal Fiscal Year, a significant transition in the evolution of The Center for Agriculture, Food and the Environment advanced in important ways. A search to fill the position of Director for the Center commenced in the summer of 2014 and the position was structured so that this individual would serve as the Director of both UMass Extension and the Massachusetts Agricultural Experiment Station. The search process was ultimately successful in identifying, recruiting and retaining a new, permanent director, Jody L. Jellison, who had been serving as Associate Director for the Virginia Agricultural Experiment Station at Virginia Tech. Dr. Jellison accepted the position in August, 2015, and began serving in in her capacity as director in January, 2016. During that prolonged period, Dr. Patricia Vittum continued in her role as Interim Director. Dr. Jellison nonetheless received and initiated communication with Center for Agriculture, Food and the Environment administrators and participated in various organizational conversations. Relevant aspects of those interactions are reflected both in this Plan of Work and also in the 2015 Annual Report submission.

The UMass Center for Agriculture, Food and the Environment is the central administrative location for research, applied research and educational outreach in agriculture, natural resources, and food systems at the University of Massachusetts, Amherst. The Center is part of the College of Natural Sciences and is home to the Massachusetts Agricultural Experiment Station and UMass Extension. Along with the University's Stockbridge School of Agriculture, the Center is the proud bearer of our national land-grant university tradition of agricultural research and education that began as Massachusetts Agricultural College in 1863. In addition to our central campus office in Amherst, there are five additional research and outreach facilities located across the state.

Agronomy and Vegetable Farm in South Deerfield - The 358-acre agronomy and vegetable farm conducts research on ethnic and other vegetable crops, agronomic and bioenergy crops, organic agriculture and pasture. The farm has a student-run vegetable project and also trains students in artificial insemination of cattle. Faculty, extension staff, and graduate students conduct applied research and are assisted by talented technicians, field staff and undergraduate students.

Cold Spring Orchard Research and Education Center in Belchertown - The 215-acre farm is the primary location for tree- and small-fruit research at the University. It also is the hands-on laboratory for all courses related to tree and small fruit and is the venue for regular extension education programs. Faculty, extension educators, technicians, farm-crew members, and numerous summer employees work together to make this farm the premier pomology facility in New England.

Cranberry Station in East Wareham - The 11-acre station does research on entomology, plant pathology, weed science, pest management, plant nutrition and horticulture and works with commercial cranberry growers. Some projects are biological control of weeds with a fungal disease and flooding to control insects and weeds that damage the fruit. The farm is considered an international leader in integrated pest management for cranberry growers and has developed for distribution ecologically based pest management practices for them.

Hadley Equine and Livestock Research and Education Center - The 131-acre Hadley Equine and Livestock Research and Education Center houses the UMass equine, sheep, swine and goat programs. Although home to some research, this facility is geared mostly toward providing hands-on experience to undergraduates in animal sciences. Students in the equine program compete nationally and two were

grooms for the Gold Medal-winning U.S. equitation team in the 2000 Olympics. The farm also has an outreach program to help owners improve the care of their animals. Full-time workers and students provide labor to run the farm.

Joseph Troll Turf Research Facility in South Deerfield - The 20-acre research facility focuses on golf courses and lawn turf with experiments ranging from testing varieties of turf grass, to water usage, nutrition, wear of sports on turf, biological control of insects and weeds and low temperature disease control. The farm has a new support building, is irrigated and well supported by the turf industry.

The Massachusetts Agricultural Experiment Station administers and distributes federal Experiment Station funds. The Experiment Station monitors agricultural, natural resource and food-related research activities in the College of Natural Sciences, encourages new research initiatives, and promotes investigations that can attract external funding and produce results that are readily applied toward solving problems in the state and region. With capacity funding allocated as a result of the federal Hatch Act of 1887 and the McIntire Stennis Forestry Research Act of 1962, the Massachusetts Agricultural Experiment Station works closely with academic departments in establishing funding priorities. To comply with federal requirements, at least 25% of the MAES funding is provided in support of "multi-state" projects; these involve collaborative activity with researchers from partnering institutions.
UMass Extension, part of the national Cooperative Extension System, provides community-based outreach education and applied research in areas related to the needs of individuals and organizations throughout Massachusetts, the knowledge and expertise of our academic partners and priorities identified by USDA National Institute of Food and Agriculture. Outreach education is provided directly through a variety of methods and materials that are tailored to specific audiences. Web sites and other new technologies make information and learning opportunities more broadly available. Most Extension work is highly collaborative, linking academic faculty and programs at UMass Amherst with research and other public agencies, nongovernmental and professional organizations.
This plan of work identifies research and extension programming in the following nine planned program areas: Global Food Security and Hunger; Climate Change; Sustainable Energy; Food Safety; Childhood Obesity; Economic Development; Youth Development; Environmental Stewardship and Center for Agriculture, Food and the Environment Administration.

Important Note Regarding Professional Extension FTEs in this Plan- The number of professional Extension FTEs in this plan has varied significantly in comparison to what was planned and reported in previous years. This does not reflect real changes in our organization, but rather changes in our approach to planning and reporting this information in response to recent guidance issued by NIFA. Specifically, we are planning more Total Extension FTEs in the "Plan Overview" because we are including all professional effort regardless of the funding source. We are also planning for fewer Professional Extension FTEs under each of the Planned Programs because we are now including only those FTEs supported by Smith-Lever funds. The guidance we refer to is online at http://nifa.usda.gov/resource/how-report-ftes-plan-work-and-annual-report.

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2017	90.0	0.0	30.0	0.0
2018	90.0	0.0	30.0	0.0

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2019	90.0	0.0	30.0	0.0
2020	90.0	0.0	30.0	0.0
2021	90.0	0.0	30.0	0.0

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

- Internal University Panel
- External University Panel
- External Non-University Panel
- Expert Peer Review

2. Brief Explanation

Massachusetts Agricultural Experiment Station
Our new director has been briefed on the current procedures whereby research projects that apply to receive Massachusetts Experiment Station funding are proposed, reviewed and funded. The director agrees that significant changes are needed that will allow us to establish a more rigorous and objective peer review process. It is unclear what specific new procedures will be implemented; but progress in this area will be communicated through this Annual Report and related NIFA Plan of Work. Until then, our current procedures will remain in place as described below
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 Agricultural Experiment Station who reviews the basic concept to ensure that it is consistent with the priorities and goals of the Center and NIFA. Prospective investigators then develop a detailed research proposal that is reviewed and approved by the faculty member's academic department chair and three disciplinary peers who comment on the scientific merit. Any necessary revisions are incorporated and final approval of projects is made by the Director of the Agricultural Experiment Station.
The Director of the Agricultural Experiment Station also solicits research initiatives in specific disciplinary areas or with other criteria, such as integration with extension type work. For these opportunities, a brief pre-proposal is required and a committee composed of faculty and professional staff identifies the strongest ideas. Prospective investigators then develop a detailed proposal and identify reviewers. The Associate Director ensures that changes recommended by reviewers are incorporated and funding is provided at the Director's discretion. Funded projects develop detailed assessment plans that will monitor and document the success of the project.

UMass Extension
University of Massachusetts Extension continues its formal agreement with Extension in Maine, Vermont, and New Hampshire to utilize a four-state, web-based planning and reporting system. Through the on-line system, program staff and administrators can access the content of plans in all four states at the organizational level, the team level and for individuals. Extension administrators from each the four states utilize the system to review work that is occurring across the region. Ongoing monthly telephone meetings with the four states are an opportunity for each of the states to provide feedback on specific programs or on the statewide goals and initiatives. The process of developing this shared system has also resulted in discussions around regional programs, opportunities for multistate work, sharing staff resources and a much better understanding of how each of our unique programs are similar to, and different from, others programs in New England. The four states have agreed to provide periodic formal and informal merit review and feedback for each state as a component of our partnership. The new system provides access to each state plan of work for all four states, 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 board, comprised of representatives of constituent organizations identified by the legislature, meets quarterly to review and advise UMass Extension and the Chancellor of UMass Amherst. Annual review of budgets, activities, outcomes and goals is a major function of this board.

III. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?
The UMass Center for Agriculture, Food and the Environment is planning a variety of new stakeholder engagement activities that will help to identify key issues and goals for our research and extension programs. These issues and goals will be incorporated into a set of programs that reflect the Planned Programs included in our Federal Plan of Work. These areas are strategically important because they reflect the convergence of our USDA mission and the research and teaching capacity of University of Massachusetts while being fundamentally important to the citizens of Massachusetts. Our planned programs will continue to reflect the needs and concerns of the people of Massachusetts and they will encompass a host of regional concerns that are relevant beyond the borders of the state of Massachusetts. Addressing these issues from a regional or multi-state perspective brings additional practical and intellectual resources and creates the potential for more comprehensive and cost-effective programs.
The Center for Agriculture, Food and the Environment ensures the close collaboration of academic faculty, professional educators and outreach specialists. Integrating research and extension education programs is the key element in our strategy to address the complex of critical issues identified by our stakeholders. Academic scholarship and traditional processes of scientific discovery are crucial for solving problems related to food production, agriculture, environmental stewardship and human health. For scientific knowledge to be useful to our constituents, a variety of approaches, technologies, curriculum and other appropriate mechanisms are needed for translating science into practice. In many cases, research and outreach can be integrated within a single programmatic effort, operating seamlessly, rather than as distinct processes and activities, in pursuit of an organizationally defined set of goals. In other cases, basic research proceeds in a more incremental fashion before it is ultimately integrated with educational programs, resources, tools or technologies that meet the needs of citizens, communities, organizations, businesses, government agencies, or policy-makers. Feedback loops for specific programmatic activities and stakeholder engagement allows for reflection and reassessment to ensure our programs are addressing strategically important

issues and are responsive to our many stakeholders.

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?
The development of this Plan-of-Work has been guided by the following values - respect for people, families, and communities; respect for diversity of people, ideas, and organizations; and a dedication to active citizen involvement. One of the most pressing challenges for realizing these values is identifying underserved and underrepresented populations that have not traditionally been participants in our programs. The Center for Agriculture, Food and the Environment has devised a new strategy for engaging stakeholders that seeks input 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. We expect these efforts will result in updated priorities and help us to connect more effectively with new and underserved audiences. We are also pursing innovative programmatic approaches and new delivery systems that will broaden participation in our programs. By collaborating with other states, UMass Extension can increase the range, number, and depth of programmatic offerings to meet a more diverse range of clientele needs. In agricultural programs in particular, producers of specialty crops such as ethnic crops, Christmas trees, maple syrup, honey, and organic products and new entry farmers will have increased access to educational resources.
In many cases the needs of underserved audiences differ substantially from those in the larger population. One notable area we are now reaching previously underserved audiences is in maternal and child health, specifically addressing the obesity epidemic for minorities and low-income population groups where rates of obesity are significantly higher. We will continue to identify specific audiences that are underserved because of their economic status or because of issues related to geographic location, economic status, age, literacy or English language proficiency.

3. How will the planned programs describe the expected outcomes and impacts?
Massachusetts Center for Agriculture, Food and the Environment activities are planned, evaluated and reported within the context of publicly identified issues that are consistent with NIFA identified priorities. Organizational teams will be working with data obtained through our new stakeholder engagement strategies to identify priorities and specific outcomes for each program, which are then reviewed and updated annually with feedback from various partners and stakeholders. Staff working on specific projects report to a set of indicators that are linked to a specific planned program. UMass Extension has developed an on-line planning system as a part of collaborative effort with three other New England States (NH, VT, ME) that staff use the system to report progress towards planned activities and outcomes.

4. How will the planned programs result in improved program effectiveness and/or
Exploring new mechanisms and new areas for integrating research with education is essential to the success of the Massachusetts Center for Agriculture, Food and the Environment and our mission, which is to serve as a unique resource to the people of Massachusetts. The Center will work collaboratively with all interested communities, industries and organizations within a context that is determined by the specific issues or problems that are being addressed. Our goal is to increase the scope of potential impacts and leverage additional resources. Reporting on specific initiatives within each planned program will assist in determining how effectively we are meeting individual and organizational goals. We are also committed to developing new criteria for judging the success of existing programs and guiding new investments. Our most effective programs will document concrete benefits while creating mutually beneficial associations between issues of public concern and the university-based research that can help address those issues. The extent to which research and practice can become more closely aligned will result in programs that reflect sound policy, incorporate best

practices and are responsive to public concerns.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages their participation

- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public

Brief explanation.

The Center for Agriculture, Food and the Environment has devised a new strategy for routinely soliciting input from internal and external stakeholders to identify organizational priorities and help us to structure our organization in ways that better serve constituents. This plan has different components that are designed to obtain feedback at both broad organizational and more specific programmatic levels and will be implemented over a period of several years. This plan is currently being implemented. A brief overview and timeline for the plan is as follows:
February 2016 - Conduct web-based survey with internal and external stakeholders. Survey will obtain 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. We will also ask respondents to suggest ways the Center could best address the identified issues and concerns. The seven areas to be assessed are:

- Agriculture and Food Systems
- Commercial Horticulture
- Water Resources
- Natural Resource Management
- Energy Use
- Youth Development
- Nutrition

In addition to implementing the strategy for obtaining organizational feedback described above, the Center will continue its efforts to obtain more detailed and specific programmatic input from stakeholders. In these cases various programs solicited input from an array of formal advisory bodies and somewhat less collaborators and participant groups. Programs and teams that engaged in focused efforts to obtain feedback from stakeholders include: Turf Program, Cranberry Station, Fruit and Vegetable Production, Greenhouse Management, Landscape & Nursery, Natural Resources Conservation, Massachusetts 4-H Livestock and Equine.
Finally, UMass Extension will continue its association with an Extension Board of Public Overseers. As directed by the enabling legislation. UMass Extension meets with the board several times per year and membership on the board is specifically defined in the enabling legislation and appointed by the governor. In the past year, individuals serving on the Extension Board of Public Overseers represented the following agencies, organizations and groups: Massachusetts Farm Bureau; MA 4-H Foundation; Massachusetts Farm Bureau; UMass Donahue Institute; Massachusetts Audubon Society; Massachusetts Arborists Association; Massachusetts State Department of Agricultural Resources; Massachusetts Forest Land Owner Association; Massachusetts Nutrition Board; Massachusetts State 4-H Advisory Council.

2(A). A brief statement of the process that will be used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

Approximately six hundred fifty individuals were identified as potential respondents for the initial stakeholder survey. Respondents 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 total of two hundred four (204) individuals responded to our survey. A specific breakdown of these respondents is as follows:

- (4%) UMass Administrator, Dean or Department Head
- (22%) Center for Agriculture Food and the Environment or UMass Extension Staff
- (21%) Center Affiliated UMass Faculty
- (4%) Other (non-affiliated) UMass Faculty
- (26%) External stakeholder, client or collaborator
- (21%) Other

The stakeholder survey is a chance 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 will 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 and well-established relationships. These individuals and groups already possess clear knowledge and understanding of our organization and programs and frequently have more concrete expectations.

2(B). A brief statement of the process that will be used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Meeting specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public

Brief explanation.

Information obtained from the survey will be used initially to guide internal discussions among Center administrators, staff and aligned faculty. Through these discussions we will establish the framework and parameters for subsequent Stakeholder Engagement. A consistent methodology will be developed to engage stakeholders, obtain feedback on our current programs and identify areas of future emphasis and involvement for both scientific research and Extension Education. The process will be implemented sequentially, so that over a defined period (e.g. 8 months), stakeholder engagement activities will focus on a single conceptual area/topic. Activities will include some combination of the following, conducted both with internal and external audiences:

- Open meetings
- Meeting with targeted groups or selected individuals
- Focus groups
- Structured and semi-structured interviews with key individuals or representatives of specific groups
- Additional surveys

In addition to the these new methods outlined above, the Center will continue to engage in ongoing activities designed to obtain input from stakeholders. Formal opportunities to obtain feedback occur when UMass Extension convenes the Extension Board of Public Overseers. While these interactions include programmatic presentations and organizational updates, they 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.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Action Plans

Brief explanation.

A stakeholder survey, conducted in February of 2016, was the first major initiative in our new process to obtain important public feedback on our organization and programs. Two hundred and four individuals participated in the survey that asked respondents what are the most significant public issues and concerns in seven areas that reflect the priorities and expertise within the Center. Respondents also indicated the degree to which they felt each of the following was a priority for addressing problems and concerns in each of the seven areas:

- basic scientific research
- applied research
- public education and technical assistance

- inform public policy

According to our survey, respondents believe that applied research was the highest priority for Commercial Horticulture and for Agriculture and Food Systems. Public education and technical assistance was the highest priority in the areas of Youth Development and Nutrition. Informing public policy was the highest rated priority for Water Resources, Natural Resources Management and Energy Use.

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V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger

2. Brief summary about Planned Program

The Center for Agriculture, Food and the Environment is working to expand local food production by meeting the needs of current food producers, encouraging new entry farmers, and educating families about smart eating. By promoting safe and abundant local food, we can help residents move toward good health while protecting natural resources and the unique character of Massachusetts communities. The increasing demand for fresh, local food poses questions: How can we grow more? How can we make certain that the food is safe? How do we protect our valued resources along the way - soil, air, water? How can we ensure that everyone is able to access important food resources? How can we work to increase the availability of healthy food in urban areas? To thrive, farmers must have continued access to innovative research, must develop new crops and must produce the foods that will allow access to new markets, such as the states' expanding immigrant populations. Post-harvest efficiencies and renewable energy technologies will also help to reduce costs. Efforts will also be undertaken taken to reduce the number of those who are food insecure.

Successful farming relies on environmentally sustainable practices. The Center for Agriculture supports these practices with research on soil fertility, maximizing the nutritional quality of crops, nutrient cycling and conservation. We provide technical information and public education in farm ecology, new and alternative crop and forage species and advanced management techniques. In partnership with the Mass. Department of Agricultural Resources, we provide training in Good Agricultural Practices (GAP) for local farmers to assure the safety of our Massachusetts- grown products and for certification in the state's Commonwealth Quality program.

We continue to develop and promote integrated pest management, a set of practices that growers use to protect their crops from destructive pests while reducing use of chemical pesticides. The Center's Extension Nutrition Education Program has project offices in Boston, Worcester, Springfield, Lawrence, Brockton, Fall River, Holyoke and Barnstable. Nutrition education for low-income children and families is designed and implemented in collaboration with schools and community organizations. Our nutrition education programs reach hundreds of thousands of youth and adults each year. Project offices employ staff who are members of the communities in which they teach and are therefore familiar with the cultural background and learning styles of participants. The program also works with teachers who provide nutrition education.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	11%		5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		8%	
204	Plant Product Quality and Utility (Preharvest)	6%		0%	
205	Plant Management Systems	15%		3%	
206	Basic Plant Biology	0%		6%	
211	Insects, Mites, and Other Arthropods Affecting Plants	16%		11%	
212	Diseases and Nematodes Affecting Plants	16%		15%	
216	Integrated Pest Management Systems	26%		4%	
301	Reproductive Performance of Animals	0%		9%	
304	Animal Genome	0%		3%	
307	Animal Management Systems	5%		0%	
311	Animal Diseases	0%		18%	
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	0%		3%	
604	Marketing and Distribution Practices	5%		2%	
701	Nutrient Composition of Food	0%		2%	
703	Nutrition Education and Behavior	0%		2%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%		9%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Situation

Massachusetts is a geographically small state with a history of innovative agriculture, a dense population, and a significant segment of its residents hungry or at risk of hunger on a daily basis. The demand for locally grown food is increasing from all socioeconomic levels, with urban farmers' markets helping to bring fresh food to underserved areas. At the same time, arable land is increasingly precious. The number of Massachusetts farms has increased significantly in the last few years, but averages only 85 acres, and

most are family-owned. A significant proportion of farm products are sold directly by producers to consumers. Simultaneously, many Massachusetts communities continue to experience land-use pressure with development threatening existing farmland. Accurate and timely research and education is a critical component in growers' ability to create a viable local food production capacity.

Priorities

Advanced pest management tactics
Plant varieties and physiology
Soil quality and fertility
Food components and functionality
Sustainable vegetable production and marketing
Sustainable fruit production and marketing
Sustainable cranberry production
Plant and soil diagnostics
Urban agriculture and food systems

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Stakeholders understand that the Massachusetts Center for Agriculture, Food and the Environment conducts research and provides accurate and timely information necessary to improve the pest management, nutrient management, marketing, and overall production and management abilities of farmers.

Stakeholders will be motivated to adopt changes that will continue to insure the success of Massachusetts agriculture.

Sufficient faculty and staff with the necessary scientific knowledge and educational expertise will be dedicated to the implementation of this plan.

For Massachusetts food producers to take advantage of new and expanding markets and to remain competitive, financial planning and marketing initiatives need to be implemented that compliment research activities.

Faculty and staff working effectively with new farmers are needed to implement this plan

The long-term viability of food production in Massachusetts depends on new generations of people who want to farm and have access to the resources necessary to be successful.

2. Ultimate goal(s) of this Program

Stronger Food Production Systems - Develop and expand systems for environmentally sound and economically viable food production, distribution, access and utilization.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	3.0	0.0	14.7	0.0
2018	3.0	0.0	15.0	0.0
2019	3.5	0.0	15.0	0.0
2020	3.5	0.0	15.0	0.0
2021	3.5	0.0	15.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Demonstrations
- Diagnostic Services
- Facilitated Group Meetings and Conferences
- Grant Submission or Other Funding Proposal
- Individual Consultations and Site Visits
- Printed Material (newsletter, factsheet, field manual)
- Published Article (News, Professional, Trade)
- Research Project (Applied Research)
- Research Project (Basic Research)
- Single day workshop, presentation or event
- Survey, Needs Assessment, or Other Data Collection
- Websites or Other Electronic Delivery
- Workshop series or educational course

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

The primary audience for this plan are Massachusetts growers and food production-related businesses. This includes established producers as well as new, immigrant, part-time, conventional and organic growers. Others audiences include government agencies, non-profit and community-based organizations, including food banks and pantries that serve low-income families. The broader scientific community involved in basic and applied research related to all aspects of food production is another key audience.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Demonstrations
- Facilitated Group Meetings and Conferences
- Individual Consultations and Site Visits
- Printed Materials
- Single day workshop, presentation or event
- Websites or other computer-based delivery
- Workshop series or educational course
- Peer review publications
- Applied Research Projects
- Research, Grant or Policy Report
- Survey, Needs Assessment or Other Data Collection
- Published News, Professional or Trade Article
- Diagnostic Services
- Grant Submission or Other Funding Proposal

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Participants acquire knowledge and skills for practices that ensure economically viable food production.
2	Participants adopt practices that ensure economically viable food production
3	Participants acquire knowledge and skills for practices that ensure the environmentally sustainable food production
4	Participants adopt practices that ensure environmentally sustainable food production
5	Creation and synthesis of knowledge related to Global Food Security and Hunger
6	Food production enterprises in Massachusetts are more robust, diverse and economically viable

Outcome # 1

1. Outcome Target

Participants acquire knowledge and skills for practices that ensure economically viable food production.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices
- 216 - Integrated Pest Management Systems
- 205 - Plant Management Systems
- 204 - Plant Product Quality and Utility (Preharvest)

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Participants adopt practices that ensure economically viable food production

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Participants acquire knowledge and skills for practices that ensure the environmentally sustainable food production

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Participants adopt practices that ensure environmentally sustainable food production

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 216 - Integrated Pest Management Systems
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Creation and synthesis of knowledge related to Global Food Security and Hunger

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 102 - Soil, Plant, Water, Nutrient Relationships
- 301 - Reproductive Performance of Animals
- 701 - Nutrient Composition of Food
- 205 - Plant Management Systems
- 307 - Animal Management Systems
- 216 - Integrated Pest Management Systems
- 604 - Marketing and Distribution Practices

- 212 - Diseases and Nematodes Affecting Plants
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 206 - Basic Plant Biology

4. Associated Institute Type(s)

- 1862 Research

Outcome # 6

1. Outcome Target

Food production enterprises in Massachusetts are more robust, diverse and economically viable

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 212 - Diseases and Nematodes Affecting Plants
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 216 - Integrated Pest Management Systems
- 102 - Soil, Plant, Water, Nutrient Relationships

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The Global Food Security and Hunger Planned Program is actually a composite of projects and initiatives. Projects within the planned program employ a range of different evaluation strategies that vary in their degree of formality and rigor. Standard evaluation components may be employed routinely or annually that reflect the mandated requirement for specific, leveraged funding sources. Formal evaluations are not typically conducted every year for every project, but approaches are tailored based on available resources, leadership and the timing of expected outcomes. Evaluation methods include web-based or written surveys, administered at strategic time points, as well as checklists, interviews and reviews of third-party data. Formal evaluations will be supplemented by anecdotal reports, case studies, testimonies and simple observations, typically of the types of changes in knowledge, behavior or practices that serve as the anticipated impacts for each project.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Climate Change

2. Brief summary about Planned Program

Research and outreach on climate change supported by the Center for Agriculture, Food and the Environment explores both the effects of climate change on natural systems and agriculture as well as mitigation strategies. The Center supports research that investigates the growth patterns of Massachusetts forests and how climate change may influence local food production and the migration of plant species. The high degree of "home rule" in Massachusetts' communities is also reflected in efforts to understand the balance between policies that are focused on adapting to the effects of climate change versus those that seek to mitigate climate change. New climate change initiatives involve the interrelationship between extreme weather events and the state's water resources, focusing specifically on supporting ecologically restorative flood prevention and remediation in New England. Combining science and public education, faculty are conducting research while developing tools and implementing strategic approaches that allow communities to confront threats to water resources. Agricultural program specialists are working with growers to develop and implement practices that could mitigate effects of climate change.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water	10%		0%	
112	Watershed Protection and Management	50%		0%	
131	Alternative Uses of Land	0%		10%	
132	Weather and Climate	40%		47%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		2%	
213	Weeds Affecting Plants	0%		41%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Situation

Climate change is often discussed on a global level, leaving many of the local issues and implications poorly understood. Climate change is predicted to have strong environmental impacts in Massachusetts, affecting decision-making around natural resources, agricultural, landscape practice and environmental questions. Increased temperatures, unusual patterns of snow cover, higher sea levels and changes in precipitation are likely to manifest in our state, and these factors are pivotal to the future availability and quality of water resources and food. The current development of planning tools for climate change and increased variability at the state level, such as appropriately scaled climate change projections and watershed-based modeling, is very limited.

Priorities
Natural system responses
Climate monitoring
Mitigation practices and policies
Water resources and climate change
Soil and water availability for crops

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Stakeholders understand that the Massachusetts Center for Agriculture conducts research and provides accurate and timely information necessary to understand natural system responses to changes in climate.

Stakeholders will have the necessary motivation and incentives to adopt changes that will reduce or mitigate the negative consequences that climate change has on agriculture and natural systems in Massachusetts.

Sufficient faculty and staff with the necessary scientific knowledge and educational expertise will be dedicated to the implementation of this plan.

2. Ultimate goal(s) of this Program

Reduce or mitigate the effects or risks associated with future changes in climate or weather.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	1.4	0.0	0.7	0.0
2018	1.4	0.0	0.7	0.0
2019	1.4	0.0	0.7	0.0
2020	1.4	0.0	0.7	0.0
2021	1.4	0.0	0.7	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Analytic Tools and Techniques
- Facilitated Group Meetings and Conferences
- Printed Material (newsletter, factsheet, field manual)
- Published Article, Book or Chapter (Academic)
- Research, Grant, or Policy Report
- Single day workshop, presentation or event
- Websites or Other Electronic Delivery
- Workshop series or educational course

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

General public, land owners, food producers, municipal officials, state agencies and regulators

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Facilitated Group Meetings and Conferences
- Printed Materials
- Single day workshop, presentation or event
- Websites or Other Computer-based Delivery
- Peer review publications
- Analytic Tools and Techniques
- Workshop series or educational course
- Research, Grant, or Policy Report

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Participants acquire knowledge and skill to reduce or mitigate the effects or risks associated with future changes in climate or weather
2	Participants implement practices to reduce or mitigate the effects or risks associated with future changes in climate or weather
3	Creation and synthesis of knowledge related to future changes in climate or weather
4	Massachusetts Ecosystems are managed in ways that reduce or mitigate the effects or risks associated with future changes in climate or weather

Outcome # 1

1. Outcome Target

Participants acquire knowledge and skill to reduce or mitigate the effects or risks associated with future changes in climate or weather

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 132 - Weather and Climate
- 112 - Watershed Protection and Management
- 111 - Conservation and Efficient Use of Water

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Participants implement practices to reduce or mitigate the effects or risks associated with future changes in climate or weather

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 132 - Weather and Climate
- 112 - Watershed Protection and Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Creation and synthesis of knowledge related to future changes in climate or weather

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land

- 111 - Conservation and Efficient Use of Water
- 132 - Weather and Climate
- 112 - Watershed Protection and Management

4. Associated Institute Type(s)

- 1862 Research

Outcome # 4

1. Outcome Target

Massachusetts Ecosystems are managed in ways that reduce or mitigate the effects or risks associated with future changes in climate or weather

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 132 - Weather and Climate
- 112 - Watershed Protection and Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Our main Extension Climate Change initiative seeks to increase the number of New England rivers subject to ecologically restorative flood prevention and remediation. The initiative is focused on facilitating changes in land use planning and management, municipal regulations, improvements in institutional coordination mechanisms, improved policy implementation or improved funding approaches that better support ecologically restorative flood prevention and remediation. The ultimate long term

goals is that New England communities will suffer less flood damage in the future, and aquatic, riparian and floodplain species populations and ecosystems grow more robust and interconnected. The short and intermediate terms goals and attendant evaluation strategies are focused on measuring participants knowledge and skills related to private and public decisions and practices that support long-term flood prevention and remediation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Sustainable Energy

2. Brief summary about Planned Program

The Center for Agriculture, Food and the Environment continues to develop research and public education initiatives focused on sustainable energy. The center continues to promote a relatively new educational program on green building techniques and pursue research and outreach on agricultural production practices that conserve energy, reduce costs and introduce the use of renewable energy sources on farms. The Center is supporting faculty research in key areas: energy conservation, bioenergy crops and microorganisms; alternative fuel production processes; renewable energy; and the economics of energy.

Our bio-energy research involves assessing several crops for use as biomass fuels. These include: switchgrass, a stress-tolerant grass for cultivation in marginally useful agricultural land; Brassica juncea, sometimes known as mustard greens; and Crambe abyssinica. Both Brassica juncea and Crambe are also possible sources of oilseed, as are sunflower, oilseed rape, and soybean, all under examination for their biodiesel development potential. Significant research on alternative fuel production is focused on increased utilization of waste material from farms and forest production. The Center is investigating the conversion of waste material to various forms of energy, including ethanol, biodiesel, and other forms of biomass. Renewable energy research on the use of agricultural land for photovoltaic arrays above pasture or crop production will allow farmers to take advantage of the need for utility companies to diversify their energy sources while maintaining land for use by farmers. Additional integrated research and outreach initiatives are focused on higher degrees of energy conservation and efficiency in residential and institutional settings and for operating food-related businesses such as farms and food pantries.

A new Clean Energy Extension initiative provides outreach and extension to the Commonwealth. Similar to the role of UMass Extension in agriculture, the UMass Clean Energy Extension will provide the legitimacy, impartiality, and local responsiveness to assist entities in evaluating and implementing clean energy opportunities, to help businesses offer clean energy technologies into the marketplace, and to support applied research to address technical and policy challenges facing clean energy.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
131	Alternative Uses of Land	0%		2%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		43%	
202	Plant Genetic Resources	0%		43%	
402	Engineering Systems and Equipment	30%		2%	
504	Home and Commercial Food Service	0%		3%	
511	New and Improved Non-Food Products and Processes	30%		7%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	40%		0%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Situation

The price and availability of energy have significant influence over the success and well-being of businesses, families and communities in Massachusetts. Local farms and businesses depend on a sustainable and affordable energy supply. Management decisions about energy will become more important as supplies tighten and prices increase. Efforts to increase the availability of locally grown food (such as extending the traditional growing season) will serve to intensify energy concerns and increase the importance of practical energy sources for growers. Sustainable energy is an area of growing concern for the health of our regional economy.

Priorities

- Bio-energy crops and microorganisms
- Alternative fuel production
- Economics of energy
- Renewable energy for agricultural production
- Energy conservation and efficiency in residential and commercial buildings
- Energy conservation and efficiency in food based businesses
- Reduce market barriers and accelerate the adoption of clean energy

2. Scope of the Program

- In-State Extension
- In-State Research

- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Stakeholders understand that the Massachusetts Center for Agriculture conducts research and provides accurate and timely information necessary to understand renewable energy and energy conservation

Stakeholders will have the necessary motivation and incentives to adopt changes that will increase the use of renewable energy and conservation practices and in Massachusetts.

Sufficient faculty and staff with the necessary scientific knowledge and educational expertise will be dedicated to the implementation of this plan.

2. Ultimate goal(s) of this Program

Individuals, business owners, and institutional leaders will implement policies and practices that increase energy efficiency and the use of renewable energy sources

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	0.3	0.0	1.3	0.0
2018	0.3	0.0	1.5	0.0
2019	0.3	0.0	1.5	0.0
2020	0.3	0.0	1.5	0.0
2021	0.3	0.0	1.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Committee or Board Service
- Diagnostic Services
- Facilitated Group Meetings and Conferences
- Grant Submission or Other Funding Proposal
- Individual Consultations and Site Visits
- Research Project (Applied Research)

- Websites or Other Electronic Delivery

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

Growers, agricultural businesses, real estate developers, building managers, municipalities, public utilities, homeowners, institutional leaders and decision-makers

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Applied Research Projects
- Analytic Tools and Techniques
- Diagnostic Services
- Grant Submission or Other Funding Proposal
- Individual Consultations and Site Visits
- Academic Article, Book or Chapter
- Committee or Board Service
- Facilitated Group Meetings and Conferences

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Creation and synthesis of knowledge related to environmentally sustainable energy resources
2	Target audiences adopt practices that increase energy efficiency
3	Target audiences increase knowledge and skill for practices that increase energy efficiency
4	Target audiences increase use of energy from renewable sources
5	Target audiences increase knowledge and skill for utilizing energy from renewable sources

Outcome # 1

1. Outcome Target

Creation and synthesis of knowledge related to environmentally sustainable energy resources

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Target audiences adopt practices that increase energy efficiency

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Target audiences increase knowledge and skill for practices that increase energy efficiency

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Target audiences increase use of energy from renewable sources

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Target audiences increase knowledge and skill for utilizing energy from renewable sources

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Public Policy changes
- Government Regulations

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Specific evaluation approaches will continue to focus on measuring a set of key indicators: 1) The extent to which target audiences learn and adopt building and design practices that increase energy efficiency, and 2) the extent to which target audiences learn and adopt building and design practices that increase the use of renewable energy sources. New extension components are being designed that will assist entities in evaluating and implementing clean energy opportunities, to help businesses offer clean energy technologies into the marketplace, and to support applied research to address technical and policy challenges facing clean energy. As these new initiatives are implemented, related strategies for accountability and demonstrating impact will be developed

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Food Safety and Functionality

2. Brief summary about Planned Program

The Center for Agriculture, Food and the Environment addresses food safety from a variety of perspectives. A primary approach is to focus on prevention of foodborne illness. Food science research projects funded through the Massachusetts Agricultural Experiment Station address tracking, inhibition and control of pathogens that will result in new or improved methods to minimize risk. Investigations also address the need for methods to accompany increasingly rapid food chain delivery modes in order to minimize the amount of food that is distributed and consumed while testing for pathogens is in process. Additional research is focused on the molecular structure, functional characteristics and bioactive components of foods. Based on recent technological advances, the nature and properties of foods are being investigated in order to create novel food components and delivery systems that will result in higher levels of nutritional quality, durability and consumer desirability.

New food safety education and outreach initiatives involve training specific groups who are responsible for handling food. Staff have developed sustainability standards for agricultural commodities and provide training, in collaboration with the Massachusetts Department of Agricultural Resources, for farmers in "Good Agricultural Practices (GAP)" that result in reduced risk of contamination for food grown on Massachusetts farms. This training prepares farmers for participation in the state's Commonwealth Quality program as well as for GAP certification. Information on processing techniques that guard against foodborne illness are delivered to growers seeking certification to develop value-added products from food they grow on their own farms. Food safety principles and practices are also being introduced to high school students to expand their understanding of potential future coursework and careers in science. Finally, innovative techniques for testing and sterilizing produce rinse water are being explored and disseminated.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
311	Animal Diseases	0%		2%	
501	New and Improved Food Processing Technologies	20%		0%	
502	New and Improved Food Products	0%		36%	
504	Home and Commercial Food Service	0%		4%	
701	Nutrient Composition of Food	0%		13%	
702	Requirements and Function of Nutrients and Other Food Components	0%		2%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	20%		9%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	60%		24%	
723	Hazards to Human Health and Safety	0%		3%	
724	Healthy Lifestyle	0%		7%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Situation

Foodborne pathogens account for millions of illnesses in the U.S. each year, with the highest rates occurring among young children, adults with weakened immune systems, older adults, and pregnant women. The annual medical cost of foodborne illness in Massachusetts has been estimated at over $200 million. Federal agencies have established guidelines for workers who handle foods in retail businesses, residential facilities, schools and child care settings. USDA and FDA have also established recommendations for "Good Agricultural Practices" to help prevent microbial contamination that can occur on farms where food is produced.

As a result of technological advances in physics and chemistry, additional opportunities are emerging to gain insight into the fundamental molecular organization of food. Considerable benefits can be realized by creating new food components that enhance the chemical and physical stability of foods, resulting in products with improved shelf-life or that can deliver nutrients while maintaining their visual appeal and taste. Structural design principles can also being used to create reduced-fat versions of familiar food products without adversely affecting texture, flavor or color. It is also possible to design entirely new food components with the structures and properties required to deliver bioactive ingredients that have specific health benefits. Such advances can lead to improvements in national health, reduce the financial cost of health problems, and increase the competitiveness of the US food industry.

Priorities

Formations, growth and inhibition of bacterial pathogens
Physiology, control and rapid detection of food pathogens
Bioactive and structural characteristics of food for improved health, quality, safety and marketability
Food safety education and certification for growers, food service workers and food processors

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Adequate funding for food safety research will be maintained and educational materials to promote food safety will be effectively disseminated.

Partner organizations will continue to collaborate with UMass on statewide food safety initiatives

Stakeholders understand that the Massachusetts Center for Agriculture conducts research and provides accurate and timely information necessary to understand safe food handling practices

Stakeholders will have the necessary motivation and incentives to adopt changes that will increase the use safe food handling practices in Massachusetts.

Sufficient faculty and staff with the necessary scientific knowledge and educational expertise will be dedicated to the implementation of this plan.

2. Ultimate goal(s) of this Program

Food safety risks and hazards will be effectively controlled and the negative impacts of food borne illness will be minimized

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	0.8	0.0	6.0	0.0

2018	0.8	0.0	6.0	0.0
2019	0.8	0.0	6.0	0.0
2020	0.8	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Workshop series or educational course
Websites or Other Computer-based delivery
Peer review publications
Analytic Tools and Techniques
Grant Submission or Other Funding Proposal
Individual Consultations and Site Visits
Printed Materials
Published News, Professional or Trade Article
Single day Workshop, Presentation or Event

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop	● Web sites other than eXtension

3. Description of targeted audience

Food growers/producers
Food Processors
Food Retailers
Food Service Managers
Residential care facility staff
School cafeteria workers
General public
Cosmetic and Pharmaceutical industries
Farmers Markets

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Workshop series or educational course
- Websites or Other Computer-based delivery
- Peer review publications
- Analytic Tools and Techniques
- Grant Submission or Other Funding Proposal
- Individual Consultations and Site Visits
- Printed Materials
- Published News, Professional or Trade Article
- Single day Workshop, Presentation or Event

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Creation and synthesis of knowledge related to the safety, and the functional and bioactive properties of food.
2	Participants acquire knowledge and skill to avoid food borne illness and control other food safety risks and hazards
3	Participants adopt practices to avoid food borne illness and control other food safety risks and hazards

Outcome # 1

1. Outcome Target

Creation and synthesis of knowledge related to the safety, and the functional and bioactive properties of food.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components
- 502 - New and Improved Food Products
- 501 - New and Improved Food Processing Technologies
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Participants acquire knowledge and skill to avoid food borne illness and control other food safety risks and hazards

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 501 - New and Improved Food Processing Technologies
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Participants adopt practices to avoid food borne illness and control other food safety risks and hazards

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 501 - New and Improved Food Processing Technologies
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Evaluations will focus on measuring the degree to which participants adopt practices to avoid food borne illness and control other food safety risks and hazards. Specific attention will be paid to understanding the decisions food industry professionals make, the development of food safety management plans and practices that ensure the safe and healthy production of value-added products from specialty crops.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Childhood Obesity

2. Brief summary about Planned Program

The Center for Agriculture, Food and the Environment Nutrition Education initiatives have a strong presence throughout the state, with project offices in Boston, Worcester, Springfield, Lawrence, Raynham and Barnstable. Nutrition education activities for low-income children and families are designed and implemented in collaboration with schools and community organizations. Our nutrition education programs reach hundreds of thousands of youth and adults in Massachusetts each year. Many of these project offices employ staff who are also members of the communities in which they teach and are therefore familiar with the cultural background and learning styles of program participants. The program also engages school teachers who provide nutrition education. The curriculum focuses on making well-informed choices for both food and physical activity that become part of daily routines and help participants to avoid obesity and overweight in the future.

Research funded through the Center includes investigation of the efficacy of nutrition education programs that serve low-resource children and families. Additional studies are focused on understanding and promoting healthy lifestyles and diets for specific demographic groups in Massachusetts that include: older adults, postpartum Cambodian women and Headstart children. Funded research is also directed towards the discovery of food components that enhance the delivery of specific nutrients and reduce obesity.

New integrated research and extension initiatives are focused specifically on the nutritional health issues of low income and racial and ethnic minorities who are at high risk of food insecurity and poor health outcomes, including overweight and obesity.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
502	New and Improved Food Products	0%		7%	
703	Nutrition Education and Behavior	50%		76%	
704	Nutrition and Hunger in the Population	15%		0%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%		0%	
724	Healthy Lifestyle	25%		17%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Situation

Childhood obesity is increasingly a problem in Massachusetts and across the nation. It was recently determined that more than one-third of children ages 2-5 in Massachusetts who participate in WIC (a needs-based nutrition program) are either currently overweight or at risk for future weight problems. Overweight and obesity substantially increase the risk of type 2 diabetes and other health problems, including certain cancers. In a recent study, 80% of Massachusetts' pediatric clinicians estimated that up to 9% of their young, overweight patients have type 2 diabetes. Many school-age children in Massachusetts subsist on a diet heavy in carbohydrates and fats and do not consume the recommended five or more servings of vegetables and fruits each day. Many of the same children are unlikely get adequate amounts of daily physical activity. These are the critical factors influencing childhood weight gain. Childhood overweight and obesity have both human and financial costs. A financial analysis estimated the annual, total obesity-related medical costs in Massachusetts to be $1.8 billion.

Priorities

- Changing the health trajectory for key target audiences through diet and activity
- Food based approaches for health and obesity prevention
- Nutrition education for low-income families and other high-risk populations

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension

- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

USDA funding and related state allocations are sufficient to maintain effective nutrition education programs

Academic expertise in the Nutrition department maintains and expands its association with the UMass Center for Agriculture

Individuals will have the necessary access to the food and related community resources needed to support healthy food choices.

2. Ultimate goal(s) of this Program

Improve children's eating consistent with federal guidelines and recommendations

Increase children's level of physical activity

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	1.5	0.0	1.0	0.0
2018	1.5	0.0	1.0	0.0
2019	2.0	0.0	1.0	0.0
2020	2.0	0.0	1.0	0.0
2021	2.0	0.0	1.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Committee or Board Service
- Curricula/Instructional materials
- Demonstrations
- Displays and Exhibits
- Printed Material (newsletter, factsheet, field manual)
- Published Article, Book or Chapter (Academic)
- Single day workshop, presentation or event
- Workshop series or educational course

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

Youth and families from limited-resource communities, specifically those who are eligible for federal food assistance (Supplemental Nutrition Assistance Program); school teachers, social service organizations

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Demonstrations
- Displays and Exhibits
- Single day workshop, presentation or event
- Workshop series or educational course
- Peer review publications
- Academic Poster or Presentation
- Curricula/Instructional Materials
- Committee or Board Service
- Printed Material

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Participants gain knowledge and skill to improve physical activity behaviors
2	Participants improve physical activity behaviors
3	Participants gain knowledge and skill to improve dietary behaviors
4	Participants improve dietary behaviors
5	Creation and synthesis of knowledge related to childhood obesity
6	Participants improve food resource management behaviors
7	Participants increase use of effective nutrition education resources and materials

Outcome # 1

1. Outcome Target

Participants gain knowledge and skill to improve physical activity behaviors

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Participants improve physical activity behaviors

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Participants gain knowledge and skill to improve dietary behaviors

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Participants improve dietary behaviors

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 704 - Nutrition and Hunger in the Population
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Creation and synthesis of knowledge related to childhood obesity

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Research

Outcome # 6

1. Outcome Target

Participants improve food resource management behaviors

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 704 - Nutrition and Hunger in the Population
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

1. Outcome Target

Participants increase use of effective nutrition education resources and materials

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The Child Obesity Planned Program includes 2 projects that are based on major national initiatives: The Expanded Food and Nutrition Education program and the SNAP-Ed program. These two programs

must comply with specific evaluation practices required by the Federal Food and Nutrition Service. We will continue to use the evaluation components identified nationally for EFNEP and in the annual SNAP-Ed plan of work that measure changes in knowledge and behaviors related to childhood obesity. New initiatives are focused specifically on the nutritional health issues of low income and racial and ethnic minorities who are at high risk of food insecurity and poor health outcomes, including overweight and obesity. These efforts will be evaluated through survey and interview methods that consider participants' practices related to the purchasing, preparation and consumption of fruits and vegetables. Additional evaluative efforts will consider changes in attitudes and practices regarding the initiation an duration of infant breastfeeding.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Economic Development

2. Brief summary about Planned Program

The Center for Agriculture, Food and the Environment has strong working relationships with food producers and professional communities in the environmental horticulture industries - nursery, turf, floriculture, arboriculture, and other industry groups. The key emphasis in this work is to support and encourage these businesses to provide their services in an environmentally sensitive manner while remaining profitable. Issues such as water use, pest management, invasive plants and pests, soil conservation, and reduced use of chemicals are addressed for the benefit of the businesses, their communities and the natural resources on which they depend. The Center benefits from a new, high-quality greenhouse and laboratory facility that enhances the research and teaching programs in these areas.

The Massachusetts Agricultural Experiment Station funds a strong portfolio of programs that have an impact on economic development in areas directly related to agriculture. Robust research continues in the areas of animal health and reproduction. Tree fruit scientists are pursuing research to help growers develop promising new varieties, marketing and distribution strategies while ongoing research on turf management issues is conducted at the University's Joseph Troll Turf Research Center in South Deerfield.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%		0%	
111	Conservation and Efficient Use of Water	15%		10%	
133	Pollution Prevention and Mitigation	10%		0%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		27%	
204	Plant Product Quality and Utility (Preharvest)	6%		0%	
205	Plant Management Systems	22%		0%	
211	Insects, Mites, and Other Arthropods Affecting Plants	11%		27%	
212	Diseases and Nematodes Affecting Plants	11%		13%	
511	New and Improved Non-Food Products and Processes	0%		13%	
601	Economics of Agricultural Production and Farm Management	10%		0%	
605	Natural Resource and Environmental Economics	0%		2%	
723	Hazards to Human Health and Safety	5%		0%	
801	Individual and Family Resource Management	0%		5%	
802	Human Development and Family Well-Being	0%		3%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Situation

In addition to a vibrant food production capacity, the Massachusetts agricultural sector includes many additional revenue generating activities. Nursery businesses, landscaping services, tree care, turf management, greenhouses, retailers, livestock and horse-related businesses all make meaningful contributions to our state's economy by creating jobs, supporting local communities and providing valued services. Like all types of agriculture, these enterprises are environmentally based and their long-term success depends upon maintaining up-to-date and effective practices to conserve and enhance soil, water and other natural resources. They also share a stake in maintaining positive community relationships and supporting the unique character of the region. A skilled workforce, access to ongoing sources of training and professional development, and timely, non-biased accurate information on a range of topics are critical to success of these businesses.

The size of this agricultural economic sector is significant. There are estimated to be over 5,000 such firms

in Massachusetts, not including livestock and horse owners. In 2009, they generated $2.6 billion in income and employed 68,000 people. More than 10,000 additional employees are needed to meet a growing demand.

Priorities

- Pesticide Education
- Landscape management and nursery production
- Sustainable floriculture and greenhouse management
- Sustainable turf management
- Plant Tissue Diagnostics

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

The MA Center for Agriculture, Food and the Environment will work effectively with partner organizations to achieve this plan

There will continue to be faculty capacity to partner with in developing applied research projects

Agricultural green industry businesses will be effective in helping to maintain open space and public benefit in the face of increasing real estate values

2. Ultimate goal(s) of this Program

Natural and human resources related to agricultural industries will be managed or cultivated in ways that support strong local economies.

Agricultural businesses in Massachusetts will be managed in ways that are both economically viable and environmentally sustainable.

The risk to individuals from exposure to pesticides and fertilizers will be minimized

The risk to businesses and to the environment posed by exotic pests, diseases and invasive species will be minimized

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	5.0	0.0	1.2	0.0
2018	5.2	0.0	1.2	0.0
2019	5.5	0.0	1.5	0.0
2020	6.0	0.0	1.5	0.0
2021	6.0	0.0	1.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Facilitated Group Meetings and Conferences
Individual Consultations and Site Visits
Printed Materials
Single day workshop, presentation or event
Websites or other computer-based delivery
Workshop series or educational course
Applied Research Projects
Diagnostic Services
Peer review publications

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
• Education Class • Workshop • Demonstrations	• Newsletters • Web sites other than eXtension

3. Description of targeted audience

Farmers
Landowners
Resource Managers
Horticultural Green Industry businesses and personnel
Professional Organizations and Industry Groups
Natural Resource Agencies
Municipalities

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Facilitated Group Meetings and Conferences
- Individual Consultations and Site Visits
- Printed Materials
- Single day workshop, presentation or event
- Websites or other computer-based delivery
- Workshop series or educational course
- Applied Research Projects
- Diagnostic Services
- Peer review publications
- Committee or Board Service
- Community Service Project
- Demonstrations
- Printed Material

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Participants acquire knowledge and skills that enhance the environmental sustainability of agricultural businesses.
2	Participants adopt practices that enhance the environmental sustainability of agricultural businesses.
3	Participants acquire knowledge and skills that enhance the economic viability of agricultural businesses
4	Participants adopt practices that enhance the economic viability of agricultural businesses
5	Creation and synthesis of knowledge related to the environmentally sustainable and economic viabilty agricultural businesses

Outcome # 1

1. Outcome Target

Participants acquire knowledge and skills that enhance the environmental sustainability of agricultural businesses.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 133 - Pollution Prevention and Mitigation
- 211 - Insects, Mites, and Other Arthropods Affecting Plants

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Participants adopt practices that enhance the environmental sustainability of agricultural businesses.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 133 - Pollution Prevention and Mitigation
- 211 - Insects, Mites, and Other Arthropods Affecting Plants

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Participants acquire knowledge and skills that enhance the economic viability of agricultural businesses

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems

- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Participants adopt practices that enhance the economic viability of agricultural businesses

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Creation and synthesis of knowledge related to the environmentally sustainable and economic viabilty agricultural businesses

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics
- 211 - Insects, Mites, and Other Arthropods Affecting Plants

4. Associated Institute Type(s)

- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Description

The value of real estate still makes development a very appealing option for those who own land and are involved in agricultural green industries

The cost of doing business in Massachusetts is an ever increasing factor in the success of agricultural business in MA

The price of energy and other inputs will play a significant role in economic development. Higher prices will mean higher production costs

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The Economic Development Planned Program is composed of several projects. Projects within the planned program employ a range of different evaluation strategies that vary in their degree of formality and rigor. Standard evaluation components may be employed routinely or annually that reflect the mandated requirement for specific, leveraged funding sources. Formal evaluations are not typically conducted every year for every project, but approaches are tailored based on available resources, leadership and the timing of expected outcomes. Evaluation methods include web-based or written surveys, administered at strategic time points, as well as checklists, interviews and reviews of third-party data. Formal evaluations are further supplemented by anecdotal reports, case studies, testimonies and simple observation, typically of the types of changes or practices that serve as the anticipated project impacts.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Youth Development

2. Brief summary about Planned Program

The Center for Agriculture, Food and the Environment is home to the 4-H Youth Development Program in which small groups of young people work together under the guidance of adult volunteer leaders, with the supervision and leadership of UMass Extension staff, to explore an area of common interest. Currently, clubs are focused on a wide variety of topics including science, engineering, technology, and animal agriculture. Other methods and models are employed to create positive youth development experiences for ages 5 to 18, including school enrichment programs, camping, and programs with collaborating youth-serving agencies. All youth development programs and projects created by UMass Extension include consistent elements that emphasize life-skills and preparation for active citizenship. A new partnership with the National 4H Mentoring Program allows youth to learn about technology while participating in community service projects. These experiences help youth become more comfortable with applied sciences and provide exposure to careers that involve technology.

From communication skills to recordkeeping, from teamwork to valuing diversity, life-skills education helps participating youth become competent, caring, well-informed and engaged members of their communities. Each year, nearly 2,000 adult volunteers and collaborators, each carefully screened by UMass Extension staff, led these efforts for tens of thousands of youth participants across the state.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	20%		0%	
806	Youth Development	80%		0%	
	Total	100%		0%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Situation
Preparing young people for the economic, scientific and civic challenges of the 21st century is a major concern that requires a coordinated effort. Youth development research has documented that youth are best able to reach their full potential in environments that offer safety, caring adults, and opportunities for authentic experience. Adults, educators and youth workers need ongoing professional development and curriculum resources in order to share their energy and expertise with youth in ways that support their positive growth as citizens, workers, neighbors and parents. Positive youth development experiences are frequently accompanied by decreases in alcohol use, tobacco use, and violence, while increasing positive attitudes and social behaviors. According to the Tufts Study on Positive Youth Development, these experiences are likely to result in youth who excel in school, are recognized as leaders by their peers and contribute to their communities.

Priorities

- Life-Skills
- Community service
- Science, Engineering & Technology
- Youth Mentoring
- Urban programs targeting at-risk youth
- Support for Military Families

2. Scope of the Program

- In-State Extension
- Multistate Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

- Staffing levels for 4H remain stable
- There is adequate support for ongoing staff development
- UMass Amherst and UMass Extension recognize an organization-wide commitment to youth development
- Faculty remain actively involved in youth development programs for the purpose of providing subject

matter, outreach and teaching
- Staff members incorporate strategies and tactics of the 4-H strategic plan into their individual plan of work
- University and Extension support collaborations across program areas
- Extension continues its partnerships with Massachusetts 4-H Foundations, Essex County 4-H Foundation and 4-H camps
- Volunteers and collaborators provide continued support and participation within the 4-H volunteer network
- Staff successfully measure program impacts.

2. Ultimate goal(s) of this Program

Massachusetts youth grow into physically and emotionally healthy individuals who are actively engaged, members of the community.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	7.5	0.0	0.3	0.0
2018	7.5	0.0	0.3	0.0
2019	7.5	0.0	0.3	0.0
2020	7.5	0.0	0.3	0.0
2021	7.5	0.0	0.3	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- 4-H Clubs
- Community Service Project
- Curricula/Instructional materials
- Direct - Other
- Displays and Exhibits
- Facilitated Group Meetings and Conferences
- Individual Consultations and Site Visits
- Printed Material (newsletter, factsheet, field manual)
- Single day workshop, presentation or event
- Websites or Other Electronic Delivery
- Workshop series or educational course

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

- Youth from all backgrounds
- Adults from all backgrounds (volunteers, parents, collaborating organization staff)
- Youth Serving Organizations and Programs from diverse communities (including K-12, Home Schooled youth, and Camps)
- Community Coalitions
- UMass Amherst Faculty
- Faculty from other colleges and universities

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- 4-H Clubs
- Community Service Projects
- Curricula/Instructional Materials
- Facilitated Group Meetings and Conferences
- Printed Materials
- Single day workshop, presentation or event
- Websites or other computer-based delivery
- Workshop series or educational course
- Displays and Exhibits
- Individual Consultations and Site Visits

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Youth acquire skills that will help them succeed academically and in the workplace
2	Youth demonstrate skills that will help them succeed academically and in the workplace
3	Youth are effective team members, communicators, and leaders
4	Youth increase knowledge and skill and interest in science, engineering and technology
5	Youth engage in community service
6	Youth acquire citizenship skills

Outcome # 1

1. Outcome Target

Youth acquire skills that will help them succeed academically and in the workplace

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Youth demonstrate skills that will help them succeed academically and in the workplace

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Youth are effective team members, communicators, and leaders

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Youth increase knowledge and skill and interest in science, engineering and technology

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Youth engage in community service

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

Youth acquire citizenship skills

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

- Decreasing state and federal funding
- Competition for grant funding
- Discontinued or reduced funding from the Massachusetts 4-H Foundation.
- Faculty and staff over-extended with current work load.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The Youth Development Planned is composed primarily of our state 4H Youth Development program and several additional grant funded programs. Projects employ a range of different evaluation strategies that vary in their degree of formality and rigor. Standard evaluation components may be employed routinely or annually that reflect the mandated requirement for specific, leveraged funding sources. Formal evaluations are not typically conducted every year for every project, but approaches are tailored based on available resources, leadership and the timing of expected outcomes. Evaluation methods include web-based or written surveys, administered at strategic time points, as well as checklists, interviews and reviews of third-party data. Formal evaluations are further supplemented by anecdotal reports, case studies, testimonies and simple observation, typically of the types of changes or practices that serve as the anticipated project impacts.

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Environmental Stewardship

2. Brief summary about Planned Program

The Center for Agriculture, Food and the Environment supports the development and deployment of new approaches and tools for environmental stewardship based on an evolving scientific understanding of both ecological and human systems. Our work in this area is multifaceted and broad, with research and public education mutually reinforcing and informing one another. Projects draw upon academic expertise while leveraging the resources and networks of agency and community partners in collaborative efforts that increase scientific knowledge while solving environmental problems.

Projects are focused on developing specific educational opportunities - including networks, workshops, and web sites, on creating new analytic tools for enhancing environmental stewardship and on providing environmental services such as soil diagnostics and consultation on urban forestry. The Center frequently engages community collaborators as equal partners in projects intended to facilitate communication and linkages among individuals, groups, and agencies. A common goal is to strengthen the environmental stewardship capacity of organizations, communities and citizens. Research initiatives are focused on combating invasive species that threaten our forests and food supply. Additional work is centered on human interactions (environmental decision-making, communication, and volunteer cooperation) as well as the nature and function of open space within our communities.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%		3%	
111	Conservation and Efficient Use of Water	0%		4%	
112	Watershed Protection and Management	5%		9%	
123	Management and Sustainability of Forest Resources	24%		0%	
124	Urban Forestry	10%		0%	
131	Alternative Uses of Land	2%		0%	
133	Pollution Prevention and Mitigation	2%		17%	
135	Aquatic and Terrestrial Wildlife	10%		9%	
136	Conservation of Biological Diversity	14%		0%	
211	Insects, Mites, and Other Arthropods Affecting Plants	8%		16%	
212	Diseases and Nematodes Affecting Plants	8%		0%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	0%		36%	
216	Integrated Pest Management Systems	2%		0%	
307	Animal Management Systems	0%		1%	
311	Animal Diseases	0%		2%	
605	Natural Resource and Environmental Economics	0%		3%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	5%		0%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Situation

In Massachusetts, we increasingly view stewardship of our natural environment as both an economic and an ethical imperative. The Commonwealth has more than six million residents and a land mass of only 10,555 square miles. This translates to 625 people per square mile, compared to the population density of Wisconsin, for example, with only 105 people per square mile. The state is 63% forested, and much of the control and influence for the care of that land rests with public and private groups at the town or city level. Massachusetts cannot wait for a perfect understanding of the various threats to biodiversity and

ecosystem integrity before implementing programs and policies that address the increasing vulnerability of our state's natural resources.

Priorities

- Wildlife management
- Forest and land conservation
- Aquatic ecosystems
- Environmental policy and municipal education
- Fish, wildlife, and biodiversity conservation
- Forest conservation
- Land protection and community preservation
- Urban Forestry

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

We will continue to rely on strong relationships that currently exist with many target audiences such as agricultural, landscape and other resource based businesses, conservation organizations, state and federal agencies, and municipal boards.

Faculty not already working with the MA Center for Agriculture will be willing to engage in applied research and education that addresses environmental stewardship

Collaborative efforts between extension and experiment station staff and faculty will result in better opportunities to leverage additional sources of external funding

We will have well-established networks of professional staff, faculty and other university resources in agriculture, forestry, wildlife and fisheries conservation in New England and across the country

Public attitudes in Massachusetts will continue to attribute a high value to the protection of land and biodiversity.

Supported by the strong regulations in Massachusetts that protect wetlands and endangered species, people will be motivated to change practices

2. Ultimate goal(s) of this Program

The quality of land, water, plant, animal, and biodiversity resources will be protected and enhanced, and healthy self-sustaining ecosystems maintained

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	4.0	0.0	3.5	0.0
2018	4.0	0.0	3.5	0.0
2019	4.0	0.0	3.5	0.0
2020	4.0	0.0	3.5	0.0
2021	4.0	0.0	3.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Analytic Tools and Techniques
- Community Service Project
- Demonstrations
- Diagnostic Services
- Direct - Other
- Facilitated Group Meetings and Conferences
- Indirect - Other
- Individual Consultations and Site Visits
- Presentation/Poster (Academic)
- Printed Material (newsletter, factsheet, field manual)
- Research Project (Applied Research)
- Research, Grant, or Policy Report
- Single day workshop, presentation or event
- Survey, Needs Assessment, or Other Data Collection
- Websites or Other Electronic Delivery
- Workshop series or educational course

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

- Natural Resource Agencies
- Regional Planning Authorities
- Development and Planning Agencies
- Municipalities
- Conservation Organizations
- Landowners and Land Managers
- Business/Industry

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Analytic Tools and Techniques
- Diagnostic Services
- Facilitated Group Meetings and Conferences
- Printed Materials
- Published Articles (News, Professional and Trade)
- Single day workshop, presentation or event
- Survey or needs assessment
- Websites or other computer-based delivery
- Workshop series or educational course
- Applied Research Projects
- Peer review publications
- Research, Grant or Policy Report
- Curricula/Instructional Materials
- Individual Consultations and Site Visits
- Community Service Project
- Demonstrations
- Diagnostic Services

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Participants acquire knowledge and skill to promote, implement or participate in practices or programs that protect natural resources and ecosystems
2	Participants promote, implement or participate in practices or programs that protect natural resources and ecosystems
3	Creation and synthesis of knowledge related to the protection of natural resources and ecosystems

Outcome # 1

1. Outcome Target

Participants acquire knowledge and skill to promote, implement or participate in practices or programs that protect natural resources and ecosystems

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 136 - Conservation of Biological Diversity
- 135 - Aquatic and Terrestrial Wildlife
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Participants promote, implement or participate in practices or programs that protect natural resources and ecosystems

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 136 - Conservation of Biological Diversity
- 135 - Aquatic and Terrestrial Wildlife
- 133 - Pollution Prevention and Mitigation
- 123 - Management and Sustainability of Forest Resources

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Creation and synthesis of knowledge related to the protection of natural resources and ecosystems

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 136 - Conservation of Biological Diversity
- 123 - Management and Sustainability of Forest Resources
- 135 - Aquatic and Terrestrial Wildlife
- 133 - Pollution Prevention and Mitigation
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 112 - Watershed Protection and Management
- 102 - Soil, Plant, Water, Nutrient Relationships
- 124 - Urban Forestry
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 131 - Alternative Uses of Land

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Description

• Changes in base funding available to maintain core capacity to address this program
• Departmental, College and University priorities affecting the number and expertise of faculty available to address this program
• Political transitions that affect the availability of grants and contracts
• Changes in state or federal agency priorities that affect the availability of partners and collaborator
• Changes in economic conditions that alter the pattern of land development in Southern New England
• Changes in tax policy that either reduces or increases economic pressures affecting working

landscapes

• Economic viability of working forestry and wood products industry in Massachusetts affecting both the rates of land conversion and the ability to manage conservation land

• Changes in the demand for forest products, including markets for lumber, firewood, and biomass energy that could change the extent and nature of timber harvesting in Massachusetts.

• Occurrence of new exotic pests, diseases, or invasive species with exceptionally high environmental or economic impacts

• Changes in local, state and federal regulations

• Unforeseen changes in technology that significantly affects our ability to manage ecosystems or communicate with target audiences

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The Environmental Stewardship Planned Program is actually a composite of projects and initiatives. Projects within the planned program employ a range of different evaluation strategies that vary in their degree of formality and rigor. Standard evaluation components may be employed routinely or annually that reflect the mandated requirement for specific, leveraged funding sources. Formal evaluations are not typically conducted every year for every project, but approaches are tailored based on available resources, leadership and the timing of expected outcomes. Evaluation methods include web-based or written surveys, administered at strategic time points, as well as checklists, interviews and reviews of third-party data. Formal evaluations are further supplemented by anecdotal reports, case studies, testimonies and simple observation, typically of the types of changes or practices that serve as the anticipated project impacts.

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Administration - Massachusetts Center for Agriculture, Food and the Environment

2. Brief summary about Planned Program

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, the university community and our federal partners.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
901	Program and Project Design, and Statistics	20%		0%	
902	Administration of Projects and Programs	60%		50%	
903	Communication, Education, and Information Delivery	20%		50%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Situation

Massachusetts Center for Agriculture Administration provides resources and mechanisms to coordinate diverse initiatives, build the skill and capacity of staff and improve the overall effectiveness of the organization. This plan will help ensure that faculty and staff are fully aware of the scope and extent of organizational efforts and have the resources and learning opportunities to meet identified goals. During the five-year plan period, administration will engage in a variety of efforts to fulfill organizational

responsibilities, comply with federal regulations and advance the success and vitality of the organization.

Priorities

Support the Center's research, outreach and educational mission through program support and administrative services

Promote increasing integration of research and applied research with educational programs, resources, tools or technologies that meet the needs of citizens, communities, organizations, businesses, government agencies, or policy-makers.

Provide information, guidance and resources to staff, faculty, policy makers, internal and external stakeholders

Maintain, communicate and follow mandated laws, regulations, policies and reporting procedures from the state, the federal government and the university

Effectively and strategically lead and manage the organization's fiscal and staffing resources and cultivate assets

2. Scope of the Program

- In-State Extension
- In-State Research
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

The Center for Agriculture retains current capacity to support programs and services

The Center continues to successfully engage academic faculty in diverse research, integrated research/extension and educational initiatives

Funding for The Center from federal, state and university source s is sustained at current levels

2. Ultimate goal(s) of this Program

Staff and faculty receive support to assist them in developing and delivering quality research and educational programs

Faculty, staff and external partners obtain accurate and timely information to guide program decisions and document the investment of fiscal resources

Diverse community members have equal access to information and educational opportunities

Research and education projects with measurable impacts are sustained through broad public input and support

Opportunities for new, innovative projects and initiatives are developed and expanded

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	3.2	0.0	0.4	0.0
2018	3.5	0.0	0.5	0.0

2019	3.5	0.0	0.5	0.0
2020	3.5	0.0	0.5	0.0
2021	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Administration of Extension and Experiment Station Projects and Programs
Administration and oversight at UMass farms facilities
Website and Other Computer-based delivery
Printed Material
Program planning and assessment
Strategic Planning and communication

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Other 1 (Administration)	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

citizens
communities
organizations
businesses
government agencies
policy-makers

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Administrative Initiatives, Systems and Procedures

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Massachusetts Center for Agriculture projects and initiatives are sustained and advanced, consistent with organizational expectations and stakeholder needs

Outcome # 1

1. Outcome Target

Massachusetts Center for Agriculture projects and initiatives are sustained and advanced, consistent with organizational expectations and stakeholder needs

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 902 - Administration of Projects and Programs

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

The transition of Extension back into the college and reorganization of UMass Extension and the Massachusetts Agricultural Experiment Station within the Center for Agriculture continues. We have great enthusiasm that this unified structure and leadership will integrate research and public outreach, engage a broad range of faculty, and effectively serve people and communities throughout the state and region.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

There are no separate evaluation activities planned for this program.