2014 University of Massachusetts Combined Research and Extension Plan of Work

Status: Accepted

Date Accepted: 06/26/2013

I. Plan Overview

1. Brief Summary about Plan Of Work

The UMass Center for Agriculture is central 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 several additional research and outreach facilities located in areas across the state.

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 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 Administration.

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

Year	Extension		Research	
	1862	1890	1862	1890
2014	110.7	0.0	28.0	0.0
2015	110.7	0.0	28.0	0.0
2016	110.7	0.0	28.0	0.0

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

Year	Extension		Research	
	1862	1890	1862	1890
2017	110.7	0.0	0.0	0.0
2018	0.0	0.0	0.0	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

Proposals for funded 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 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 comments 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 will also solicit research initiatives in specific disciplinary areas or with other criteria. For these opportunities, a brief pre-proposal is submitted and a committee composed of faculty and professional staff recommends the most promising ideas. Prospective investigators develop a detailed proposal and identify reviewers. The Director will ensure that changes recommended by reviewers are incorporated and will provide funding at the Director's discretion. Funded projects will develop a detailed assessment plan that will monitor the success of the project over a period of three years.

UMass Extension

External University Panel - University of Massachusetts Extension has entered into a formal agreement with Extension in Maine, Vermont, and New Hampshire to develop and implement 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 and different than others 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.

External Non-University Review Panel - The Massachusetts legislature established a Board of Public Overseers to provide advice and oversight to UMass Extension. This 15 member board, comprised of representatives of constituent organizations, meets quarterly to review and advise UMass Extension and the Chancellor the 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 participates in a variety of ongoing stakeholder engagement activities that result in the specification of key issues and goals for our research and extension programs. These issues and goals are incorporated into broad areas that define an overarching conceptual and organizational structure that is consistent with 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 reflect the needs and concerns of the people of Massachusetts and they also encompass a host of regional concerns that are not defined, or bound by, 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 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 process 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, in pursuit of an organizationally defined set of goals. 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 POW 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 meeting these values is identifying underserved and underrepresented populations that have not traditionally been participants in our programs. The Center for Agriculture is 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 will have increased access to educational resources. In many cases the needs of underserved audiences differ substantially from those in the larger population. UMass has planned integrated research and education programs that address a variety of food safety concerns and promote personal health. 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, or literacy (reading and English language proficiency). Both the research and the extension components of these programs are specifically designed to understand and address the concerns of these audiences.

3. How will the planned programs describe the expected outcomes and impacts?

Massachusetts Center for Agriculture activities are planned, evaluated and reported within the context of publicly identified issues that are consistent with NIFA identified priorities. Organizational teams worked initially with the data obtained through the formal stakeholder engagement process to identify priorities and specific outcomes for each program which are 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

The Massachusetts Center for Agriculture 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, rather than by the borders of a particular state. This will increase the scope of potential impacts and leverage additional resources. Continuing to explore new areas for integrating research with education is also essential to the success of the Center's overall mission which is to function as a resource to the people of Massachusetts. Reporting on specific initiatives within each planned program will assist in determining how effectively we are meeting individual and organizational goals. The most effective programs will be able to 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.

A combination of formal and informal engagement activities are used for including stakeholders in the planning and design of programs which ensures relevant research, effective outreach and strengthens the overall link between the University and citizens. Our organizational mission and goals provide a framework for ongoing interaction with stakeholders and helps to ensure broad value to the entire population of the state and the region.

The Massachusetts Center for Agriculture has strong, long-standing relationships with diverse individuals and organizations representing stakeholders from throughout Massachusetts and the region. These include professional associations, advocacy and community groups and state agencies. A partial list includes: Massachusetts Department of Agricultural Resources, Massachusetts Tree Fruit Growers, Cape Cod Cranberry Growers Association, Golf Course Superintendent's Association of New England, Massachusetts Vegetable and Berry Growers Association, Massachusetts Flower Growers Association, Massachusetts Arborists Association, New England Sports Turf Managers Association, the Massachusetts Nursery and Landscape Association, Community In Support of Agriculture, New England Small Farms Institute, Massachusetts Natural Organic Farmers Association. Representative of these groups have frequent, ongoing contact with our program staff, researchers and organizational leaders though a variety of planned and informal meetings, events and listening sessions. These activities and ongoing interactions inform the research and outreach programs and priorities of both the Massachusetts Agricultural Experiment Station and UMass Extension. The Center is also working actively to promote new relationships that will result in new opportunities and innovations that respond to changing social, political environmental and economic conditions. This will occur primarily within the context of a new organizational function referred to as "Interest Groups."

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
- Open Listening Sessions
- Needs Assessments

Brief explanation.

Interest Groups are composed of faculty and staff who share areas of common interest and expertise and who collectively plan and implement coordinated responses to identified public needs, opportunities or stakeholder expectations across the entire spectrum of Center functions from research to extension/outreach. The focus of each interest group will represent a confluence between the expertise of faculty and staff, the mission of the center and the priorities identified by the National Institute for Food and Agriculture. Interest Groups are a mechanism for establishing the intellectual foundation for the centers work and serves as a conduit between the leadership of the center and external stakeholders. They also play a key role in identifying organizational priorities, developing financial resources, scanning for opportunities and providing input and guidance for the Center's Extension and Outreach functions.

Additional stakeholder groups and advisory bodies that provide input for the activities of the Center have been established by other means. Because the Center for Agriculture resides within the College of Natural Sciences, the advisory board of the college also serves in an advisory capacity; primarily regarding the conduct of scientific research funded by the Massachusetts Agricultural Experiment Station. UMass Extension maintains a close association with an Extension Board of Public Overseers. As directed by the enabling

legislation, UMass Extension meets with the board four times per year and membership of the board is specific 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(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.

In addition to the stakeholder engagement functions of Interest Groups, formal opportunities to obtain feedback occur when UMass Extension convenes the Extension Board of Public Overseers (4 times per year). These meetings are designed largely as opportunities for listening to representatives from major stakeholder groups 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 and advisory boards, written or web-based surveys as well as many informal opportunities that transpire during the course of regular meetings, conferences events and presentations.

The Center recently initiated additional, formal opportunities for obtaining input from key stakeholder groups. We conducted a web-based survey that was sent to 365 individuals, within and external to UMass, to solicit input on the future development and scope of the UMass Center for Agriculture. Two hundred three (203) individuals responded to the survey. Half the respondents identified themselves as advisory board members or other external stakeholders, while the other half identified as UMass faculty, staff or administrators. Of nearly one hundred external stakeholders that responded, more than half (61%) indicated they had no previous involvement with the Center for Agriculture.

The Center also initiated a significant process to obtain information exclusively from internal (UMass Amherst) stakeholders; extension staff, extension faculty and academic faculty. Nearly one hundred participants gathered for a professionally facilitated meeting to discuss issues related to the transition of UMass Extension back into an academic unit (The College of Natural Sciences) and the relatively recent merging of UMass Extension and the Massachusetts Agricultural Experiment Station within the UMass Center for Agriculture. Small group discussions were convened around a series of questions related to innovation and the increasing integration of research and extension. Finally, in a series of formal listening sessions, we asked faculty from key collaborating academic departments within the College of Natural Sciences to respond to the following questions:

-How has MA Ag Experiment Station funding helped to advance your work? What are some of the problems or challenges associated with accessing or utilizing MA Ag Experiment Station funds?

-How have UMass Extension staff or resources helped to advance your work? What are some of the problems or challenges associated with accessing or utilizing UMass Extension staff or resources?

-What are some of the opportunities you see for greater integration of MA Ag Experiment Station and UMass Extension resources and how might this advance your work?

-What are some of the challenges you see for effective integration of MA Ag Experiment Station and UMass Extension resources?

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.

The key issues, goals and priorities identified within our Plan of Work are reviewed and modified annually, based on stakeholder input. The specific mechanism by which this occurs are evolving significantly as we work to more closely integrate our research and extension activities under unified leadership within the College of Natural Science. We remain committed as ever to the overarching principle that the research and extension education programs administered, supported and coordinated by the UMass Center for Agriculture are focused in areas that will have the maximum impact, relevance, and utility for the citizens of the state and the region.

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 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%	
202	Plant Genetic Resources	0%		2%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		1%	
204	Plant Product Quality and Utility (Preharvest)	11%		0%	
205	Plant Management Systems	10%		3%	
206	Basic Plant Biology	0%		9%	
211	Insects, Mites, and Other Arthropods Affecting Plants	13%		16%	
212	Pathogens and Nematodes Affecting Plants	13%		3%	
216	Integrated Pest Management Systems	23%		4%	
301	Reproductive Performance of Animals	0%		25%	
305	Animal Physiological Processes	0%		4%	
307	Animal Management Systems	7%		14%	
601	Economics of Agricultural Production and Farm Management	6%		3%	
603	Market Economics	0%		3%	
604	Marketing and Distribution Practices	6%		6%	
701	Nutrient Composition of Food	0%		1%	
703	Nutrition Education and Behavior	0%		1%	
	Total	100%		100%	

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

1. Situation and priorities

Situation

Massachusetts is a 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 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
2014	14.0	0.0	12.0	0.0
2015	14.0	0.0	12.0	0.0
2016	14.0	0.0	12.0	0.0
2017	14.0	0.0	12.0	0.0
2018	14.0	0.0	12.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Demonstrations
Diagnostic Services
Facilitated Group Meetings and Conferences
Individual Consultations and Site Visits
Presentation/Poster (Academic)
Printed Materials
Published Article (Academic)
Research Project (Applied Research)
Single day workshop, presentation or event
Websites or Other Computer-based 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
- Diagnostic Services
- 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

☑ 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

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)

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 601 - Economics of Agricultural Production and Farm Management
- 604 - Marketing and Distribution Practices

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)

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 601 - Economics of Agricultural Production and Farm Management
- 604 - Marketing and Distribution Practices

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)

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

- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants

- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 601 - Economics of Agricultural Production and Farm Management
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 701 - Nutrient Composition of Food
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 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

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 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 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. A new climate change initiative has begun that involves the interrelationship between climate change and the state's water resources. 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	25%		0%	
112	Watershed Protection and Management	25%		0%	
131	Alternative Uses of Land	0%		42%	
132	Weather and Climate	40%		0%	
133	Pollution Prevention and Mitigation	10%		4%	
136	Conservation of Biological Diversity	0%		37%	
206	Basic Plant Biology	0%		17%	
	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
2014	1.2	0.0	1.0	0.0
2015	1.2	0.0	1.0	0.0
2016	1.2	0.0	1.0	0.0
2017	1.2	0.0	1.0	0.0
2018	1.2	0.0	1.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Basic and Applied Research
Facilitated Group Meetings and Conferences
Printed Materials
Single day workshop, presentation or event
Websites or Other Computer-based 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

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

- Applied Research Projects
- Facilitated Group Meetings and Conferences
- Printed Materials
- Single day workshop, presentation or event
- Websites or Other Computer-based Delivery
- Peer review 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(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

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)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation

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
- 112 - Watershed Protection and Management
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation

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)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 136 - Conservation of Biological Diversity
- 206 - Basic Plant Biology

4. Associated Institute Type(s)

- 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

The planned program for Climate Change, previously focused exclusively on research, was recently expanded to include an extension component. Extension and outreach activities are still in the process of being designed and a plan will be created to assess the impact of those activities. One new initiative seeks to increase the number of New England rivers subject to ecologically restorative flood prevention and remediation. We are also seeking changes in 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.

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 continues to develop research and public education initiatives focused on sustainable energy. The center has created a relatively new educational program on green building techniques and continues to pursue research and outreach on agricultural production practices that conserve energy, reduce costs and initiate 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.

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
123	Management and Sustainability of Forest Resources	0%		12%	
401	Structures, Facilities, and General Purpose Farm Supplies	20%		0%	
402	Engineering Systems and Equipment	20%		13%	
404	Instrumentation and Control Systems	20%		0%	
511	New and Improved Non-Food Products and Processes	0%		13%	
605	Natural Resource and Environmental Economics	0%		12%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	40%		0%	
902	Administration of Projects and Programs	0%		25%	
903	Communication, Education, and Information Delivery	0%		25%	
	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

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
2014	0.6	0.0	4.0	0.0
2015	0.6	0.0	4.0	0.0
2016	0.6	0.0	4.0	0.0
2017	0.6	0.0	4.0	0.0
2018	0.6	0.0	4.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Applied Research
Facilitated Group Meetings and Conferences
Printed Materials

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 ● 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
- Facilitated Group Meetings and Conferences
- Printed Materials
- Single day workshop, presentation or event
- Websites or Other Computer-based Delivery
- Peer review 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(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)

- 123 - Management and Sustainability of Forest Resources
- 402 - Engineering Systems and Equipment
- 605 - Natural Resource and Environmental Economics
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

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)

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 404 - Instrumentation and Control Systems
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

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)

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 404 - Instrumentation and Control Systems
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

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)

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 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)

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 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

The planned program for Sustainable Energy, previously focused exclusively on research, was recently expanded to include an extension component. Specific evaluation approaches are still in the process of development, but we will seek to measure 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. Outreach and extension elements of this planned program are expanding beyond the current activities, and we will also be seeking to measure the extent to which Participants adopt practices that to improve energy efficiency in the storage and handling of food.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Food Safety

2. Brief summary about Planned Program

The Center for Agriculture addresses food safety from a variety of perspectives. A primary approach is to focus on prevention, specifically in the area 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. 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%		51%	
501	New and Improved Food Processing Technologies	25%		26%	
502	New and Improved Food Products	0%		1%	
511	New and Improved Non-Food Products and Processes	0%		2%	
702	Requirements and Function of Nutrients and Other Food Components	0%		6%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	25%		8%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	50%		6%	
	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
2014	1.1	0.0	5.0	0.0
2015	1.1	0.0	5.0	0.0
2016	1.1	0.0	5.0	0.0
2017	1.1	0.0	5.0	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2018	1.1	0.0	5.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Basic and Applied Research
Facilitated Group Meetings and Conferences
Printed Materials
Single day workshop, presentation or event
Websites or Other Computer-based Delivery

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
- Displays and Exhibits
- Websites or Other Computer-based delivery
- Peer review 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(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)

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

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)

- 501 - New and Improved Food Processing Technologies
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 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)

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

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

The extension and outreach capacity for food safety has recently expanded with the appointment of faculty in the Food Science department focusing on disseminating information to growers and other community-based food operations. Evaluations will seek to document the degree to which growers effectively employ tools for managing postharvest rinse water and safe practices in the development and sale of value-added products from food grown their farms.

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's Nutrition Education Program has a strong presence throughout the state, with project offices in Boston, Worcester, Springfield, Lawrence, Brockton, Fall River, Holyoke 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 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.

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
501	New and Improved Food Processing Technologies	0%		92%	
703	Nutrition Education and Behavior	50%		8%	
704	Nutrition and Hunger in the Population	20%		0%	
724	Healthy Lifestyle	30%		0%	
	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
2014	39.0	0.0	0.7	0.0
2015	39.0	0.0	0.7	0.0
2016	39.0	0.0	0.7	0.0
2017	39.0	0.0	0.7	0.0
2018	39.0	0.0	0.7	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Demonstrations
Displays and Exhibits
Printed Materials
Single day workshop, presentation or event
Workshop series or educational course
Basic and applied research

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
- Printed Materials
- Single day workshop, presentation or event
- Workshop series or educational course
- Peer review 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(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

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)

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

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)

- 501 - New and Improved Food Processing Technologies
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Research

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.

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 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 was recently a key collaborator for a new, high-quality greenhouse and laboratory facility that will enhance the research and teaching programs in these areas.

The Massachusetts Agricultural Experiment Station funds a strong portfolio of education 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	8%		0%	
133	Pollution Prevention and Mitigation	11%		0%	
204	Plant Product Quality and Utility (Preharvest)	11%		0%	
205	Plant Management Systems	22%		0%	
211	Insects, Mites, and Other Arthropods Affecting Plants	11%		11%	
212	Pathogens and Nematodes Affecting Plants	11%		0%	
216	Integrated Pest Management Systems	3%		0%	
304	Animal Genome	0%		15%	
305	Animal Physiological Processes	0%		5%	
311	Animal Diseases	0%		15%	
312	External Parasites and Pests of Animals	0%		41%	
601	Economics of Agricultural Production and Farm Management	10%		0%	
605	Natural Resource and Environmental Economics	10%		6%	
723	Hazards to Human Health and Safety	3%		0%	
801	Individual and Family Resource Management	0%		5%	
802	Human Development and Family Well-Being	0%		2%	
	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 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
2014	13.0	0.0	3.0	0.0
2015	13.0	0.0	3.0	0.0
2016	13.0	0.0	3.0	0.0
2017	13.0	0.0	3.0	0.0
2018	13.0	0.0	3.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Applied Research
Demonstrations
Diagnostic Services
Displays and Exhibits
Facilitated Group Meetings and Conferences
Individual Consultations and Site Visits
Presentation/Poster (Academic)
Printed Materials
Published Article (Academic)
Published Article (news, professional, trade
Research, Grant, or Policy Report
Single day workshop, presentation or event
Websites or Other Computer-based 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 ● 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

- Demonstrations
- Displays and Exhibits
- Facilitated Group Meetings and Conferences
- Individual Consultations and Site Visits
- Printed Materials
- Published Articles (New, Professional and Trade)
- Single day workshop, presentation or event
- Websites or other computer-based delivery
- Workshop series or educational course
- Applied Research Projects
- Diagnostic Services
- Academic Presentation/Poster
- Peer review publications
- 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 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)

- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems

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)

- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems

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)

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

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

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants

- 216 - Integrated Pest Management Systems
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 311 - Animal Diseases
- 312 - External Parasites and Pests of Animals
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

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 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.

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
2014	15.0	0.0	0.0	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2015	15.0	0.0	0.0	0.0
2016	15.0	0.0	0.0	0.0
2017	15.0	0.0	0.0	0.0
2018	15.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

4-H Clubs
Community Service Project
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

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

☑ 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 is working to develop and deploy 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. The common goal is to strengthen the environmental stewardship capacity within communities. 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	15%		30%	
112	Watershed Protection and Management	5%		5%	
123	Management and Sustainability of Forest Resources	15%		0%	
124	Urban Forestry	5%		6%	
131	Alternative Uses of Land	5%		0%	
133	Pollution Prevention and Mitigation	5%		0%	
135	Aquatic and Terrestrial Wildlife	5%		0%	
136	Conservation of Biological Diversity	10%		0%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		20%	
212	Pathogens and Nematodes Affecting Plants	5%		39%	
608	Community Resource Planning and Development	15%		0%	
723	Hazards to Human Health and Safety	5%		0%	
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
2014	14.0	0.0	2.4	0.0
2015	14.0	0.0	2.4	0.0
2016	14.0	0.0	2.4	0.0
2017	14.0	0.0	2.4	0.0
2018	14.0	0.0	2.4	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Analytic Tools and Techniques
Basic and Applied Research
Diagnostic Services
Displays and Exhibits
Facilitated Group Meetings and Conferences
Printed Materials
Published Article (Academic)
Published Article (news, professional, trade)
Research, Grant, or Policy Report
Single day workshop, presentation or event
Survey or needs assessment
Websites or Other Computer-based 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
- Displays and Exhibits
- Peer review publications
- 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 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
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity

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

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)

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

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

Massachusetts Center for Agriculture Administration

2. Brief summary about Planned Program

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

3. Program existence : New (One year or less)

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	25%		10%	
902	Administration of Projects and Programs	50%		70%	
903	Communication, Education, and Information Delivery	25%		20%	
	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
2014	8.6	0.0	0.2	0.0
2015	8.6	0.0	0.2	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2016	8.6	0.0	0.2	0.0
2017	8.6	0.0	0.2	0.0
2018	8.6	0.0	0.2	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.