# 2011 University of Massachusetts Combined Research and Extension Plan of Work

**Status: Accepted**

**Date Accepted: 05/28/2010**

## I. Plan Overview

### 1. Brief Summary about Plan Of Work

Transition at the University of Massachusetts culminated in the Natural Resources and the Environment and the College of Natural Sciences and Mathematics combining to become the College of Natural Sciences. The College of Natural Sciences is lead by our dean, Steve Goodwin. Consecutively with this transition, UMass Extension came back to the college. The Massachusetts Center for Agriculture was created under the college. Associate Dean Stephen Herbert has been named the Director of the Center for Agriculture. The Massachusetts Agricultural Experiment Station (MAES) and UMass Extension both now report to the Center for Agriculture. Dr. Stephen Herbert is also the director of the Massachusetts Agricultural Experiment Station and Patricia Cromack is the Assistant Director. Nancy Garrabrants remains the Director of UMass Extension. With the new organizational structure we at the Center for Agriculture will be creating a combined plan of work for FY2011. The mission of the Center for Agriculture at the University of Massachusetts is to advance knowledge in core areas through research and outreach. To accomplish this, the College offers broad educational opportunities to a wide spectrum of public audiences, conducts applied and basic research that addresses the needs of citizens, businesses, and public agencies and makes numerous outreach opportunities accessible to its constituents.

The College is uniquely qualified, equipped, and committed to fulfilling its land grant responsibilities by promoting and contributing to economic development, environmental quality and human capacity building. Continued commitment to increase the scientific focus within a more limited number of projects is ongoing. Currently there are 66 distinct Hatch projects, 14 McIntire Stennis projects and 22 grants supported by MAES. This plan of work calls for projects in the following nine planned program areas.

The nine planned program areas are: 1) Global Food Security and Hunger, 2) Climate Change, 3) Sustainable Energy, 4) Food Safety, 5) Childhood Obesity, 6) Economic Development, 7) Youth Development, 8) Environmental Stewardship, 9) Extension/Experiment Station Administration - Center for Agriculture

The concept underlying the Center for Agriculture is a single point of entry for stakeholders and users to access the land grant resources of the University of Massachusetts, and thereby the national system. The Center is a primary source of information on the state of agriculture in Massachusetts and plays a pivotal role in the integration of research and extension at the university. Stakeholders are an integral part of research and extension at the University of Massachusetts, providing input in both formal and informal ways. There is continuous input and interaction between primary stakeholders and the components of UMass Extension and the Massachusetts Agricultural Experiment Station. This continues to be true for the FY11-15 period which is the catalyst for the new combined report. This is a deliberate design to insure that the issues addressed by extension cut across all of the planned research programs of the experiment station.

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

| Year | Extension | | Research | |
|---|---|---|---|---|
| | 1862 | 1890 | 1862 | 1890 |
| 2011 | 102.3 | 0.0 | 30.0 | 0.0 |
| 2012 | 102.0 | 0.0 | 30.0 | 0.0 |
| 2013 | 102.0 | 0.0 | 28.0 | 0.0 |
| 2014 | 102.0 | 0.0 | 28.0 | 0.0 |
| 2015 | 102.0 | 0.0 | 28.0 | 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 -** Prior to submittal, a short white paper is submitted to the Director or designee proposing a project and describing how it is relevant to the NIFA priorities and the constituents of the state. If the project is accepted it is then reviewed by the relevant department head for approval. Submitted projects are then evaluated by an internal university panel that consists of one faculty member active in MAES, the Director of the Center for Agriculture/MAES, and the Assistant Director for MAES. Proposed projects are also judged on their relevance to the critical issues identified in the POW. Three peer reviewers selected from amongst MAES stakeholders, at least two of whom are experts in the proposed area of research will be asked to provide written reviews of the scientific merit of the proposed project. Final approval of projects will be made by the Director or Assistant Director of MAES.

**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 planning and reporting system. Working in collaboration with three other states in developing our system has also resulted in discussions around state and 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. As a result, the four states have agreed to provide merit review for each state as part of our formal 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. Further, we've agreed to set up a rotating system of more comprehensive merit review by selecting a different state plan each year for in-depth review by Extension staff from the other three states. With this system, we will be sharing plans with one another continuously, and every four years every state's plan will go through a more rigorous review process by the other three states. The Massachusetts Extension Plan of Work is set to be reviewed by the other three states in 2012.

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. Review of the Plan of Work 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 Massachusetts Experiment Station continually participates with UMass Extension in comprehensive stakeholder engagement process that resulted in the specification of nine critical issues that define the conceptual structure for our programs. These nine issues, that also serve as the UMass Extension Planned Programs in the Federal Plan of Work, 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 citizen of Massachusetts. The nine critical issues encompass a host of regional concerns that are not defined, or bound by, the borders of the state of Massachusetts (e.g., food production, water and ecosystem protection, and economic development). They also cut across the matrix of all of the planned programs of MAES. Addressing these issues from a regional or multi-state perspective brings additional practical and intellectual resources to bear and creates the

potential for more comprehensive and cost effective programs. The Center for Agriculture is designed to insure integration of research and educational programs. Integrating research and education programs is the key element in our strategy to address the complex of critical issues identified by our stakeholders. Data on these issues will be provided via statistical web documentation in conjunction with Umass Extension and the Massachusetts Department of Agriculture.Academic scholarship and traditional process of scientific discovery are crucial for solving problems related to water quality, food production, ecosystem and human health. However, 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 process, in pursuit of an organizationally defined set of goals. Representatives from both the MAES & UMExt have been working with the Massachusetts Department of Agricultural Resources to promote an important initiative in Massachusetts. We continue to work with our partners in the hopes that some of this past state funding will return. This Center shall continue to provide a broad range of technical and business development services to the commonwealth's agricultural producers so that they may add value to the commonwealth's agricultural economy.

**2. How will the planned programs address the needs of under-served and under-represented populations of the**

The development of this POW has been guided by the following values - respect for people, families, and communities; respect for the diversity of people, ideas, and organizations; and a dedication to active citizen involvement. The most pressing challenge for meeting these values is identifying underserved and underrepresented populations that have not traditionally been participants in our programs. The Center for Agriculture is exploring new print and electronic outlets for broadening out the 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 products. 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 have identified specific audiences that are underserved because of their economic status or because of issues related to literacy (reading and English language proficiency). The research component of these programs and the supporting educational materials are specifically designed to meet the needs 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 efficiency?**

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 addressed, rather than by the borders of any 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 mission, 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 also involving an intimate and mutually reinforcing relationship between issues of public concern and the university-based research that can help address those issues. The extent to which research and practice can become more closely aligned will result in programs that reflect sound policy, incorporate best practices and are responsive to public concerns.

## IV. Stakeholder Input

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

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

**Brief explanation.**

The Massachusetts Agricultural Experiment Station and UMass Extension have strong, existing relationships with a variety of organizations representing stakeholders from throughout Massachusetts and the region. Several commodity-based organizations, such as the Massachusetts Tree Fruit Growers, the Cape Cod Cranberry Growers Association, the Golf Course Superintendent's Association of New England and the Massachusetts Vegetable and Berry Growers Association provide research facilities and grants that supplement and help to direct the research and outreach activities of the MAES and UMass Extension. Groups such as the Massachusetts Flower Growers Association, the Massachusetts Arborists Association, the New England Sports Turf Managers Association, the Massachusetts Nursery and Landscape Association, Community In Support of Agriculture (CISA), the New England Small Farms Institute, and the Massachusetts Natural Organic Farmers Association help to set the agenda for research and educational activities. Direct consultations with these groups provide a partnership for identifying and solving problems of mutual concern. This model of including growers and other clients in participatory research to solve problems strengthens the link between the University and citizens, keeps the research relevant to real problems and speeds transfer of solutions to end-users. At its best, research is not targeted at specific sub-populations and the goals put forward in this POW are intended to be far-reaching so that the research undertaken is anticipated to be of value to the entire population of the state and the region. The development of this POW has been guided by the following values - respect for people, families, and communities; respect for the diversity of people, ideas, and organizations; and a dedication to active citizen involvement. To insure that these values are upheld and that the research benefits all members of the broader community it is necessary to make sure that all citizens wishing to participate in the stakeholder process have more than ample opportunity. This requires holding stakeholder meetings, twilight meetings, and listening sessions in urban as well as rural settings. This also requires going beyond traditional outlets when advertising these opportunities.

### 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

**Brief explanation.**

The College of Natural Sciences has a 20 member advisory board with representatives from across the spectrum of scientific areas within the Massachusetts Agricultural Experiment Station. Extension has an oversight board called the Board of Public Overseers who meet regularly and provide direction and guidance. There is also a state mandated Cranberry Oversight Committee that makes recommendations for all research and extension activities at the Cranberry Experiment Station. The committee consists of three cranberry growers; the Commissioner of Agriculture, Scott Soares ; Massachusetts legislators, currently Representative John Quinn and Senator Teresa Murray; and the Dean of the College of Natural Sciences, Steve Goodwin. These boards meet between two and five times each year and provide direct stakeholder input. They also help to identify new participants for the stakeholder process. There is an annual stakeholders roundtable that is held in conjunction with Farm Bureau. The roundtable includes participation from all of the commodity groups listed above as well as the Massachusetts Department of Agricultural Resources. It is also the policy of the Massachusetts Agricultural Experiment Stationto participate in all focus groups and listening sessions that are convened by UMass Extension.

**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.**

The Massachusetts Agricultural Experiment Station and UMass Extension have direct consultations with faculty, staff and the dean of the college and with our constituents and commodity groups that establish sustained partnerships for identifying and solving problems of mutual concern. This model of including growers and other clients in the design of participatory research and public education programs to solve problems strengthens the link between the University and citizens, keeps the research and outreach relevant to real problems and speeds transfer of solutions to end-users.

**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.**

Most faculty in the College of Natural Sciences combine research, instruction and outreach/extension activities. When faculty and staff interact with stakeholders, they represent both research and extension. Input from stakeholders concerning research needs informs implementation of research projects. Ultimately information gained from both formal and informal stakeholder processes, informs both research and extension issue identification and the resulting research projects and extension education programs. The identification of emerging issues culminates when faculty propose new research projects. These projects are evaluated through the merit review process that examines their relevance to the plan of work. The priorities for the POW are reexamined every year taking into account the totality of the stakeholder input. In addition, the critical issues identified by UMass Extension are continuously modified based on stakeholder input and this provides a cross-check to insure that the research programs of the Massachusetts Agricultural Experiment Station are directed towards areas that will have the maximum impact on 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 Massachusetts Center for Agriculture addresses national and global food security through research and extension education in support of local and regional food systems. Sustainable food production protects natural resources and preserves community character while providing citizens with a healthy, fresh and stable supply of food. Massachusetts is emerging as a leader in a growing national movement to create sustainable, local food production capacity. Rapidly expanding consumer demand for direct sales, organic production, specialty crops, farmstand products and community-supported farms reflect a growing interest and commitment to local agriculture. Massachusetts farmland however is an extremely vulnerable resource, as land development pressure remains intense in this densely populated state. More than ever, farmers need access to scientific knowledge, new production techniques and marketing strategies to help them remain competitive in a global market.

Food production in Massachusetts is remarkably diverse and includes apple and peach orchards, vegetable and berry farms, nursery operations, cranberry bogs, livestock and dairy farms and assorted specialty crops. The MA Center for Agriculture will be increasingly relied upon for identifying innovative practices that extend the production capacity of farmers and improve their ability to meet the growing demand for healthy, locally grown food. Research and educational programs will support food production systems throughout Massachusetts and New England in ways that are economically viable and environmentally sound.

**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 :** 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 | 0% | | 2% | |
| 202 | Plant Genetic Resources | 0% | | 4% | |
| 203 | Plant Biological Efficiency and Abiotic Stresses Affecting Plants | 0% | | 1% | |
| 205 | Plant Management Systems | 20% | | 25% | |
| 206 | Basic Plant Biology | 0% | | 4% | |
| 211 | Insects, Mites, and Other Arthropods Affecting Plants | 0% | | 7% | |
| 212 | Pathogens and Nematodes Affecting Plants | 0% | | 5% | |
| 216 | Integrated Pest Management Systems | 30% | | 3% | |
| 301 | Reproductive Performance of Animals | 0% | | 18% | |
| 305 | Animal Physiological Processes | 0% | | 5% | |
| 307 | Animal Management Systems | 0% | | 20% | |
| 601 | Economics of Agricultural Production and Farm Management | 30% | | 1% | |
| 603 | Market Economics | 0% | | 2% | |
| 604 | Marketing and Distribution Practices | 20% | | 1% | |
| 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

According to the most recent US Agriculture Census data, the number of farms nationally increased 4% between 2002 and 2007. In Massachusetts the growth has far outpaced the national average, with the number or farms growing by 27% during that 5-year period. There are now roughly 7,700 farming operations in Massachusetts that take place on approximately 500,000 acres, comprising over 10% of the state's land. Agriculture makes a significant contribution to the state's economy. In 2008, farming generated nearly $500 million in cash sales, employed more than 13,000 workers and paid nearly $100 million in wages. Massachusetts farmers are among the national leaders in direct sales to consumers, with an annual average of over $25,000 per farm. Organic production is also on the rise, with the number of organic farms more than doubling from 2002 to 2007 (from 129 to 295) and sales of organic produce increasing by about 125%.

While farming across the United States is increasingly dominated by large corporations, in Massachusetts, 80% of farms are family owned, with an average size of 85 acres. Around 95% of our farming operations fit within the official USDA "small farm" definition. For these small businesses to thrive in an intensely competitive global market, growers must continue to pursue efficiencies and innovations in production, sales and marketing while providing the environmental stewardship to preserve our land, soil and water. Farmers must also address recent concerns that maintain the safety and the security of our local food supply.

The MA Center for Agriculture is conducting scientific and educational programs to meet the needs of our existing food producers while encouraging new entry farmers and an expanding base for food production. Our integrated research and extension initiatives promote innovation in production and marketing, fuel efficiency, organic production and sustainable pest

management. Helping local food producers to thrive ensures a safe and abundant local food supply while conserving resources and maintaining the aesthetic character of life in New England.

The MA Center for Agriculture has identified the following research and extension priorities for promoting food security in Massachusetts and beyond:

1)Economically Viable Food Production- Products that are grown or produced in Massachusetts are facing intense global competition. To remain competitive, Massachusetts farmers must have continued access to new research on production initiatives that bring innovation to farmers. This involves the development of new crop opportunities for existing and new ethnic markets, and intensification of pasture utilization and integrated feed production with livestock and dairy cattle. Improved production efficiency, new marketing opportunities, and consistent evaluation of profitability are needed to ensure the economic viability of food production. Farmers and other food producers must have ready access to current research information on marketing, post-harvest efficiencies, packaging, business management strategies and appropriate renewable energy technologies for increased farm viability. In addition, research programs in the physiological management of mainstream and specialty crops and animals can give food producers the tools needed to increase production efficiency while enhancing crop and animal quality. Growers can improve their competitiveness through the development and adoption of technologies that will reduce management and crop productions costs, reduce risks of contamination and increase market share. Educators can assist with private strategies, public policies, price, product quality, and traceability determinants of food system performance.

2) Environmentally Sustainable Food Production- For vegetable, fruit and livestock producers to thrive, it is necessary they maintain the natural resources systems that serve as their foundation. Research and extension at the University of Massachusetts provides access to current information on farm ecology, new and alternative crop and forage species and varieties, and advanced management techniques that increase crop and animal production and quality while protecting the environment. Research on soil fertility, crop nutrient density (nutritional quality), nutrient cycling and conservation all benefit farm viability and the environment. Other ongoing research involves chemistry, bioavailability and toxicity of constituents in residues and treated soils, field indicators to characterize and classify wetland soils, managing growth stress for improved yields of specialized plant compounds, molecular techniques for managing animal diseases and improved fertilization and survival outcomes in animal breeding. Finally, research directed towards finding sustainable solutions to problems affecting honey bee health has the potential to affect many Massachusetts crops.

3) Safe, Local Food- Massachusetts food producers must respond to a variety of recent concerns about the safety of our food supply. It is essential that fruit, vegetable and livestock producers adhere to current guidelines that cover all aspects of food production, from growing, through storage and handling, to shipment. Consumers must have confidence that food produced in Massachusetts is not only fresh and healthy, but is also safe to consume. Research and outreach directed towards Good Agricultural Practices (GAP) for integrated vegetable farms that market directly to consumers, such as CSAs (Community Supported Agriculture), and improved nutrition and safety of locally produced and consumed foods will boost public confidence and consumption.

4) Integrated Pest Management - Extension Educators and UMass Faculty are recognized nationally for the development and promotion of IPM practices. IPM is a systems approach based on accurate pest identification and monitoring and suitable control measures in an ecologically compatible manner, to maintain pest population levels below those causing economically-significant injury. The Center for Agriculture continues research and education on advanced IPM for all agricultural crops. IPM strategies are sustainable practices that help agriculturists and communities protect the environment while maintaining profitability. IPM technologies including biological control of weeds and insects, chemical ecology to reduce pesticide use, and organic approaches reduce management and crop production costs, reduce the risk of contamination, increase marketability, and improve the health of the soil and water.

**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 work 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 in Massachusetts - 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 |
| 2011 | 12.7 | 0.0 | 7.5 | 0.0 |
| 2012 | 12.0 | 0.0 | 7.5 | 0.0 |
| 2013 | 12.0 | 0.0 | 7.5 | 0.0 |
| 2014 | 12.0 | 0.0 | 7.5 | 0.0 |
| 2015 | 12.0 | 0.0 | 7.5 | 0.0 |

## V(F). Planned Program (Activity)

### 1. Activity for the Program

Basic and applied research
Demonstrations
Diagnostic Services
Facilitated Group Meetings and Conferences
Individual Consultations and Site Visits
Printed Materials
Published Articles (News, Professional and Trade)
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<br>● Workshop<br>● Group Discussion<br>● One-on-One Intervention<br>● Demonstrations | ● Newsletters<br>● Web sites |

### 3. Description of targeted audience

A 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)

### 1. Standard output measures

**Target for the number of persons(contacts) to be reached through direct and indirect contact methods**

| | Direct Contact Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2011 | 3400 | 146000 | 0 | 400 |
| 2012 | 3400 | 146000 | 0 | 400 |
| 2013 | 3400 | 146000 | 0 | 400 |
| 2014 | 3400 | 146000 | 0 | 400 |
| 2015 | 3400 | 146000 | 0 | 400 |

### 2. (Standard Research Target) Number of Patent Applications Submitted

**2011:**0 **2012:**0 **2013:**0 **2014:**0 **2015:**1

### 3. Expected Peer Review Publications

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2011 | 40 | 6 | 0 |
| 2012 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 |
| 2014 | 0 | 0 | 0 |

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2015 | 0 | 0 | 0 |

## V(H). State Defined Outputs

### 1. Output Target

- Demonstrations

**2011:**50 **2012:**50 **2013:**50 **2014:**50 **2015:**50

- Diagnostic Services

**2011:**100 **2012:**100 **2013:**100 **2014:**100 **2015:**100

- Facilitated Group Meetings and Conferences

**2011:**8 **2012:**8 **2013:**8 **2014:**8 **2015:**8

- Individual Consultations and Site Visits

**2011:**165 **2012:**165 **2013:**165 **2014:**165 **2015:**165

- Printed Materials

**2011:**105 **2012:**105 **2013:**105 **2014:**105 **2015:**105

- Published Articles (News, Professional and Trade)

**2011:**4 **2012:**4 **2013:**4 **2014:**4 **2015:**4

- Single day workshop, presentation or event

**2011:**52 **2012:**52 **2013:**52 **2014:**52 **2015:**52

- Websites or other computer-based delivery

**2011:**12 **2012:**12 **2013:**12 **2014:**12 **2015:**12

- Workshop series or educational course

**2011:**4 **2012:**4 **2013:**4 **2014:**4 **2015:**4

- Peer review publications

**2011:**6 **2012:**0 **2013:**0 **2014:**0 **2015:**0

## V(I). State Defined Outcome

| O. No. | Outcome Name |
|---|---|
| 1 | Participants acquire knowledge and skill to ensure the economic viability of food production |
| 2 | Participants adopt practices that ensure the economic viability of food production |
| 3 | Participants acquire knowledge and skill to adopt environmentally sustainable food production practices |
| 4 | Participants adopt environmentally sustainable food production practices |

**Outcome #** 1

**1. Outcome Target**

Participants acquire knowledge and skill to ensure the economic viability of food production

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**200 | **2012:**200 | **2013:**200 | **2014:**200 | **2015:**200 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 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
- 601 - Economics of Agricultural Production and Farm Management
- 604 - Marketing and Distribution Practices

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome #** 2

**1. Outcome Target**

Participants adopt practices that ensure the economic viability of food production

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**80 | **2012:**80 | **2013:**80 | **2014:**80 | **2015:**80 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 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
- 1862 Research

**Outcome #** 3

**1. Outcome Target**

Participants acquire knowledge and skill to adopt environmentally sustainable food production practices

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**200 | **2012:**200 | **2013:**200 | **2014:**200 | **2015:**200 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome #** 4

**1. Outcome Target**

Participants adopt environmentally sustainable food production practices

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**80 | **2012:**80 | **2013:**80 | **2014:**80 | **2015:**80 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

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

**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**

## V(K). Planned Program (Evaluation Studies and Data Collection)

### 1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study

**Description**

{NO DATA ENTERED}

### 2. Data Collection Methods

- Sampling
- Whole population
- Case Study
- Observation
- Other (web-survey)

**Description**

{NO DATA ENTERED}

## V(A). Planned Program (Summary)

**Program # 2**

**1. Name of the Planned Program**

Climate Change

**2. Brief summary about Planned Program**

The evidence that global warming is occurring comes from increasing air and ocean temperatures, reductions in the amounts of ice and snow on the surface of the planet, and rising sea levels. World agriculture must meet the formidable challenge of increasing crop production for a rapidly expanding global population in a time of climate change. There will be additional, intense pressure from competition over using land to meet an increasing demand for animal-based food production versus cultivating crops as alternative energy sources for biofuels. According to the National Agricultural Biotechnology Council (NABC Report 21) agriculture produces approximately 10% of GHGs (greenhouse gasses) such as $CO_2$, $CH_4$, and $N_2O$. The report states that both crop and animal agricultural systems will need to reduce the production of GHGs, adapt to the stresses of climate change and take advantage of potential benefits and opportunities. The Massachusetts Center for Agriculture will play an important role in generating research and education for the agricultural sector, associated industries and the broader society.

**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 :** 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 |
|---|---|---|---|---|---|
| 112 | Watershed Protection and Management | 0% | | 11% | |
| 131 | Alternative Uses of Land | 0% | | 21% | |
| 133 | Pollution Prevention and Mitigation | 0% | | 51% | |
| 136 | Conservation of Biological Diversity | 0% | | 9% | |
| 206 | Basic Plant Biology | 0% | | 8% | |
| | **Total** | 0% | | 100% | |

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

**1. Situation and priorities**

Research is needed to understand the complex factors that determine the relationship between agriculture and climate change. Crop and animal systems, soil and water management will need to adapt to a host of new environmental conditions. Genetic resources, functional genomics, crop breeding, adaptation and tolerance to abiotic-stress, and enhancing crop productivity will increasingly be priority areas for basic and applied research and public education. Climate change will affect society at all levels. Research and extension through the MA Center for Agriculture can assist with developing workable solutions and critical policy recommendations.

The MA Center for Agriculture has identified the following research and extension priorities for promoting responses to climate change in Massachusetts and beyond:

1) The impacts of climate change on agriculture and the characterization of plant responses to abiotic-stress.

2) Evaluation and development of new crops and varieties using the available techniques of functional genomics,

genetic resources and crop breeding.

3) Evaluation of the impact of climate change on water resources for agriculture and communities.

4) Theoretical, experimental, valuation and empirical issues in the design of and education on environmental and natural resource policies.

**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 characterization and mechanisms of Plant Responses to Ozone in the US.

Policy response for  mitigation, which seeks to reduce greenhouse gases so as to minimize the level of climate change, and adaptation, which seeks to prepare communities for the climate changes that are already entrained.

**2. Ultimate goal(s) of this Program**

Describe the spatial - temporal characteristics of the adverse effects of current ambient O3 levels on crop productivity, including the development of numerical models to establish cause-effect relationships that apportion the ozone contribution.

A baseline understanding of the differences between local land use policy for adaptation and mitigation, to begin to identify ways to resolve any conflicts between those goals, and to do so across the spectrum of urban to rural land use. The focus of this project is on land use implications of climate change as relevant to local governments in Massachusetts.

## 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 |
| 2011 | 0.0 | 0.0 | 2.0 | 0.0 |
| 2012 | 0.0 | 0.0 | 2.0 | 0.0 |
| 2013 | 0.0 | 0.0 | 2.0 | 0.0 |
| 2014 | 0.0 | 0.0 | 2.0 | 0.0 |
| 2015 | 0.0 | 0.0 | 2.0 | 0.0 |

## V(F). Planned Program (Activity)

**1. Activity for the Program**

Basic and applied research

Demonstrations
Facilitated Group Meetings
Printed Materials
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<br>● Workshop<br>● Group Discussion<br>● One-on-One Intervention<br>● Demonstrations | ● Newsletters<br>● Web sites |

**3. Description of targeted audience**

The project will provide a significant increase in knowledge about the interrelationships between climate change and land use for the Commonwealth, will significantly increase knowledge about these issues for non-urban areas, and will encourage the consideration of climate change among local and regional government agencies.

## V(G). Planned Program (Outputs)

**1. Standard output measures**

**Target for the number of persons(contacts) to be reached through direct and indirect contact methods**

| | Direct Contact Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2011 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 |
| 2014 | 0 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 0 | 0 |

**2. (Standard Research Target) Number of Patent Applications Submitted**

**2011:**0 **2012:**0 **2013:**0 **2014:**0 **2015:**0

**3. Expected Peer Review Publications**

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2011 | 3 | 0 | 0 |
| 2012 | 3 | 0 | 0 |
| 2013 | 3 | 0 | 0 |

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2014 | 3 | 0 | 0 |
| 2015 | 3 | 0 | 0 |

## V(H). State Defined Outputs

### 1. Output Target

## V(I). State Defined Outcome

| O. No. | Outcome Name |
|---|---|
| 1 | Literature review which provided an overview of the wide body of scientific frameworks typically used for climate change mitigation and adaptation as relevant to local, regional, and state land use planners. |

**Outcome #** 1

**1. Outcome Target**

Literature review which provided an overview of the wide body of scientific frameworks typically used for climate change mitigation and adaptation as relevant to local, regional, and state land use planners.

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**1 | **2012:**0 | **2013:**0 | **2014:**0 | **2015:**0 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 131 - Alternative Uses of Land

**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 (Evaluation Studies and Data Collection)

**1. Evaluation Studies Planned**

**Description**

{NO DATA ENTERED}

**2. Data Collection Methods**

**Description**

{NO DATA ENTERED}

## V(A). Planned Program (Summary)

**Program # 3**

**1. Name of the Planned Program**

Sustainable Energy

**2. Brief summary about Planned Program**

Our collective future relies on finding practical approaches and solutions that will ensure a secure and sustainable energy supply. Agricultural production systems are one area where even minor changes in the supply and demand of energy can have major implications for the profitability of individual farms and the health of the United States economy. Energy costs profoundly influence farming practices, management decisions and products.The MA Center for Agriculture will be important in stimulating innovations in research and education to provide appropriate energy alternatives and renewable energy sources to enable growers and other energy consumers to save money, make environmentally sound choices, minimize the financial vulnerability of agricultural businesses and strengthen our society.

**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 :** 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% | | 3% | |
| 403 | Waste Disposal, Recycling, and Reuse | 0% | | 15% | |
| 511 | New and Improved Non-Food Products and Processes | 0% | | 41% | |
| 605 | Natural Resource and Environmental Economics | 0% | | 3% | |
| 902 | Administration of Projects and Programs | 0% | | 19% | |
| 903 | Communication, Education, and Information Delivery | 0% | | 19% | |
| | **Total** | 0% | | 100% | |

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

**1. Situation and priorities**

Research and education is needed to address the impact of energy costs on agriculture and for the agricultural production of alternative energy sources for use by other sectors. While the energy used in agricultural production may be low relative to other U.S. industrial sectors, it represents a major input cost to farmers.On average, nearly 15% of agricultural production costs are energy related, mostly in the direct use of diesel/gasoline, electricity and LP gas, with additional indirect investments in fertilizer and pesticides. Crop and animal farm systems have become increasingly mechanized and require costly energy inputs at multiple stages in the production cycle to achieve desired or optimum yields. In addition, increasing production of biofuel crops is diverting land from food to energy production. The MA Center for Agriculture can assist farmers with the sustainable production of energy crops. The Center will also be a source of discovery and dissemination for methods and tools to help farmers meet more of their own energy needs through conservation, renewable biofuels and other innovations, including wind, solar and hydro. Rapid changes in energy sources, supply and cost can affect society at all

levels. Research and education through the MA Center for Agriculture can be helpful in creating new opportunities and products for the agricultural sector that will to produce locally and sustainable energy solutions.

The MA Center for Agriculture has identified the following research and extension priorities for promoting responses to sustainable energy concerns in Massachusetts:

1) Producing more locally produced energy from biofuels, such as: cellulosic materials and oilseed crops, and the integration of renewable energy alternatives (e.g. solar) for use in agriculture.

2) Developing production systems to improve sustainability by lowering energy inputs, and in using marginal or idle land for growing bioenergy crops.

3) Cooperate with industry in energy conservation and use of waste food streams and biomass for energy.

4) Evaluation and development of new energy crops and products using available genetic resources and processing techniques for varying energy end product uses.

**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 to assist farmers with the sustainable production of energy crops. The Center will also be a source of discovery and dissemination for methods and tools to help farmers meet more of their own energy needs through conservation, renewable biofuels and other innovations, including wind, solar and hydro.

**2. Ultimate goal(s) of this Program**

Better tools and methods for production of energy crops.

## 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 |
| 2011 | 0.0 | 0.0 | 2.1 | 0.0 |
| 2012 | 0.0 | 0.0 | 2.1 | 0.0 |
| 2013 | 0.0 | 0.0 | 2.1 | 0.0 |
| 2014 | 0.0 | 0.0 | 2.1 | 0.0 |
| 2015 | 0.0 | 0.0 | 2.1 | 0.0 |

## V(F). Planned Program (Activity)

### 1. Activity for the Program

Basic and applied research
Demonstrations
Facilitated Group Meetings and Conferences
Printed Material
Individual Consultations and Site Visits
Printed Material
Published Articles (News, Professional and Trade)
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<br>● Workshop<br>● Group Discussion<br>● One-on-One Intervention<br>● Demonstrations | ● Newsletters<br>● Web sites |

### 3. Description of targeted audience

Dissemination has occurred as conference presentations at: 2009 Associated Collegiate Schools of Planning, Virginia (academics) 2009 Berger Transportation Symposium, Boston (practitioners and policymakers) 2009 Massachusetts Association of Conservation Commissioners, Worcester (local gov't volunteers) 2009 guest lecture to Harvard class on Climate Change and Cities (students) 2009 course Regional Planning 691 participants.

## V(G). Planned Program (Outputs)

### 1. Standard output measures

**Target for the number of persons(contacts) to be reached through direct and indirect contact methods**

| | Direct Contact Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2011 | 600 | 0 | 0 | 0 |
| 2012 | 600 | 0 | 0 | 0 |
| 2013 | 600 | 0 | 0 | 0 |
| 2014 | 600 | 0 | 0 | 0 |
| 2015 | 600 | 0 | 0 | 0 |

### 2. (Standard Research Target) Number of Patent Applications Submitted

**2011:**0 **2012:**0 **2013:**0 **2014:**0 **2015:**0

### 3. Expected Peer Review Publications

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2011 | 3 | 0 | 0 |
| 2012 | 3 | 0 | 0 |
| 2013 | 3 | 0 | 0 |
| 2014 | 3 | 0 | 0 |
| 2015 | 3 | 0 | 0 |

## V(H). State Defined Outputs

### 1. Output Target

## V(I). State Defined Outcome

| O. No. | Outcome Name |
|---|---|
| 1 | Accurate research on increased use of biomass fuels. |

**Outcome #** 1

**1. Outcome Target**

Accurate research on increased use of biomass fuels.

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**1 | **2012:**0 | **2013:**0 | **2014:**0 | **2015:**0 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 123 - Management and Sustainability of Forest Resources
- 403 - Waste Disposal, Recycling, and Reuse
- 511 - New and Improved Non-Food Products and Processes
- 605 - Natural Resource and Environmental Economics
- 902 - Administration of Projects and Programs
- 903 - Communication, Education, and Information Delivery

**4. Associated Institute Type(s)**

- 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 (Evaluation Studies and Data Collection)

**1. Evaluation Studies Planned**

- After Only (post program)
- Before-After (before and after program)
- Other (Peer Reviewed Journals)

**Description**

{NO DATA ENTERED}

**2. Data Collection Methods**

- Sampling
- Whole population
- Case Study
- Observation
- Other ()

### Description

{NO DATA ENTERED}

## V(A). Planned Program (Summary)

**Program # 4**

**1. Name of the Planned Program**

Food Safety

**2. Brief summary about Planned Program**

Food borne pathogens account for millions of illnesses and thousands of deaths in the United States each year, with the highest rates occurring among young children, adults with weakened immune system, older adults, and pregnant women. According to a 2010 report from the "Produce Safety Project" at Georgetown University, the estimated national cost of food borne illness is over $150 billion annually for medical care, lost productivity and reduced life expectancy. The annual medical cost for Massachusetts alone is over $200 million. To address these problems, federal agencies have established guidelines and recommendations for workers and managers who process and handle foods in retail establishments, residential facilities, schools and child care settings.

The Massachusetts Center for Agriculture is conducting scientific research and providing education and resources to improve the food safety knowledge and practices of people involved in all sectors of the food system. A major emphasis is working with Massachusetts fruit and vegetable growers to develop and implement farm food safety plans and prepare them for GAP certification. Center programs target food service workers, provide training to teachers and students in schools, and assist institutional and retail food managers to adopt a set of practices (HACCP) for identifying points of risk in the food production cycle. Research is focused on improving and validating production practices to reduce potential food safety problems at the farm level. The Center also participates in a coalition to assess statewide food safety priorities and identify strategies for educating food handlers and consumers. Through research, outreach and partnerships designed to reduce the incidence of food borne illness, The Center for Agriculture is committed to ensuring the safety of food grown, processed, prepared and consumed in Massachusetts.

**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 :** 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% | | 26% | |
| 501 | New and Improved Food Processing Technologies | 0% | | 12% | |
| 502 | New and Improved Food Products | 0% | | 12% | |
| 503 | Quality Maintenance in Storing and Marketing Food Products | 10% | | 4% | |
| 511 | New and Improved Non-Food Products and Processes | 0% | | 1% | |
| 603 | Market Economics | 0% | | 6% | |
| 609 | Economic Theory and Methods | 0% | | 1% | |
| 702 | Requirements and Function of Nutrients and Other Food Components | 0% | | 11% | |
| 711 | Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources | 10% | | 1% | |
| 712 | Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins | 80% | | 16% | |
| 722 | Zoonotic Diseases and Parasites Affecting Humans | 0% | | 1% | |
| 724 | Healthy Lifestyle | 0% | | 9% | |
| | **Total** | 100% | | 100% | |

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

#### 1. Situation and priorities

Food borne illness continues to plague Americans, costing the U.S. economy billions of dollars each year in lost productivity, hospitalization, long-term disability and death. The Centers for Disease Control (CDC) has estimated that food borne diseases cause approximately 76 million illnesses and 5,000 deaths each year. Research efforts are increasingly directed to understanding the nature of food borne pathogens and agencies have instituted food safety education and regulatory programs from farm to table. Federal guidelines have been established for food producers; food processors; food handlers in retail establishments; food service workers in restaurants, nursing homes, schools and child care settings; and families at home. Despite these efforts, the incidence of food borne illness remains a problem. Additional research and education is necessary to improve food safety knowledge and the practices of people involved in all sectors of the food system.

The Center for Agriculture has identified the following research and extension priorities for addressing Food Safety in Massachusetts:

1) Help Consumers Avoid Food borne Illness - Food safety research and education programs providing information about handling and preparing foods safely, improving the shelf-life of food, the activity of antimicrobial compounds for cleaning contaminated surfaces, methods to reduce the occurrence of emetic (vomiting) and diarrhoeal food borne diseases, and rapid detection of bacterial contamination.

2) Train Food Producers - especially fruit and vegetable growers, in Good Agricultural Practices (GAP) with research-based knowledge emphasizing 'farm to table'.

3) Help small food processors -to develop and implement Hazard Analysis and Critical Control Points (HACCP) systems integrated with food safety research and training on safe food processing.

4) Provide food safety training - to teachers and students and food service workers in principles and new research initiatives for safe food handling, storage and preparation.

5) Provide consumer information - a comprehensive perspective on food safety issues, including information on food allergens. Provide education and research emphasizing the interactions of food safety and security in the individual, family and community with economics of individual and collective preparedness for unpredictable global threats to people, food and the environment.

**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**

Accurate research and dissemination of materials to discover and promote food safety

**2. Ultimate goal(s) of this Program**

Basic and applied research
Diagnostic Services
Facilitated Group Meetings
Individual Consultations and Site Visits
Printed Materials
Published articles

## 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 |
| 2011 | 1.0 | 0.0 | 2.1 | 0.0 |
| 2012 | 1.0 | 0.0 | 2.1 | 0.0 |
| 2013 | 1.0 | 0.0 | 2.1 | 0.0 |
| 2014 | 1.0 | 0.0 | 2.1 | 0.0 |
| 2015 | 1.0 | 0.0 | 2.1 | 0.0 |

## V(F). Planned Program (Activity)

**1. Activity for the Program**

Basic and applied research
Workshop series or educational course
Displays and Exhibits
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<br>● Workshop | ● Web sites |

### 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)

### 1. Standard output measures

**Target for the number of persons(contacts) to be reached through direct and indirect contact methods**

| | Direct Contact Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2011 | 230 | 620 | 0 | 0 |
| 2012 | 230 | 620 | 0 | 0 |
| 2013 | 230 | 620 | 0 | 0 |
| 2014 | 230 | 620 | 0 | 0 |
| 2015 | 230 | 620 | 0 | 0 |

### 2. (Standard Research Target) Number of Patent Applications Submitted

**2011:**0 **2012:**0 **2013:**0 **2014:**0 **2015:**0

### 3. Expected Peer Review Publications

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2011 | 46 | 0 | 0 |
| 2012 | 46 | 0 | 0 |

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2013 | 46 | 0 | 0 |
| 2014 | 46 | 0 | 0 |
| 2015 | 46 | 0 | 0 |

## V(H). State Defined Outputs

### 1. Output Target

- Workshop series or educational course

**2011:**14 **2012:**14 **2013:**14 **2014:**14 **2015:**14

- Displays and Exhibits

**2011:**7 **2012:**7 **2013:**7 **2014:**7 **2015:**7

- Websites or Other Computer-based delivery

**2011:**5 **2012:**5 **2013:**5 **2014:**5 **2015:**5

## V(I). State Defined Outcome

| O. No. | Outcome Name |
|---|---|
| 1 | Participants adopt practices to avoid food borne illness and control other food safety risks and hazards |
| 2 | Participants acquire knowledge and skill to avoid food borne illness and control other food safety risks and hazards |
| 3 | Proportion of participants who adopt practices to avoid food borne illness and control other food safety risks and hazards |
| 4 | Proportion of participants who acquire knowledge and skill to avoid food borne illness and control other food safety risks and hazards |
| 5 | Accurate creation of processes add nutrients and help prevent disease. |

**Outcome #** 1

**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

| | | | | |
|---|---|---|---|---|
| **2011:**120 | **2012:**120 | **2013:**120 | **2014:**120 | **2015:**120 |

**3. Associated Knowledge Area(s)**

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 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

**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

| | | | | |
|---|---|---|---|---|
| **2011:**200 | **2012:**200 | **2013:**200 | **2014:**200 | **2015:**200 |

**3. Associated Knowledge Area(s)**

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 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

**Outcome #** 3

**1. Outcome Target**

Proportion of participants who adopt practices to avoid food borne illness and control other food safety risks and hazards

**2. Outcome Type :** Change in Action Outcome Measure

| | | | | |
|---|---|---|---|---|
| **2011:**60 | **2012:**60 | **2013:**60 | **2014:**60 | **2015:**60 |

**3. Associated Knowledge Area(s)**

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 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

**Outcome #** 4

**1. Outcome Target**

Proportion of participants who 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

| **2011:**80 | **2012:**80 | **2013:**80 | **2014:**80 | **2015:**80 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 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

**Outcome #** 5

**1. Outcome Target**

Accurate creation of processes add nutrients and help prevent disease.

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**1 | **2012:**0 | **2013:**0 | **2014:**0 | **2015:**0 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 511 - New and Improved Non-Food Products and Processes
- 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

## 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 (Evaluation Studies and Data Collection)

### 1. Evaluation Studies Planned

**Description**

{NO DATA ENTERED}

### 2. Data Collection Methods

**Description**

{NO DATA ENTERED}

## V(A). Planned Program (Summary)

**Program # 5**

**1. Name of the Planned Program**

Childhood Obesity

**2. Brief summary about Planned Program**

Childhood obesity is a national epidemic. In Massachusetts, the medical cost for obesity has been estimated at $1.8 billion per year and affects nearly one out of every three individuals between the ages of 10 and 17. Obesity is associated with increased long-term risk for heart disease, diabetes, stroke, hypertension, and some types of cancer. Fortunately, many of the chronic health problems associated with obesity are largely preventable. Families, especially those with limited resources, need effective strategies to help children be more active and choose healthy foods at home and in school. Healthy habits established during childhood can reduce the harmful effects of obesity and lead to longer more productive lives.

The Massachusetts Center for Agriculture conducts research on individuals, families, communities and policies, and how they interact with the mental and physical health of diverse low-income families. The Center also helps culturally diverse families and children across the state adopt healthier lifestyles. UMass Extension has a forty year history of fighting child obesity through educational programs targeting families with limited resources. Nutrition education programs and activities are provided through extensive collaboration with schools and community agencies to help adults and youth eligible for the federally-funded Supplemental Nutritional Assistance Program establish healthy eating habits and physically active lifestyles. Intensive workshops are also delivered to small groups of families in low-resources communities with educators recruited from the target communities that are served. Through working collaborations with community partners, the Center for Agriculture will continue to generate scientific knowledge and provide individuals and families with the resources and skills to make informed decisions that promote healthy food and physical activity choices that last a lifetime.

**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 :** 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 |
|---|---|---|---|---|---|
| 703 | Nutrition Education and Behavior | 40% | | 0% | |
| 704 | Nutrition and Hunger in the Population | 20% | | 0% | |
| 724 | Healthy Lifestyle | 40% | | 0% | |
| | **Total** | 100% | | 0% | |

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

**1. Situation and priorities**

Healthy lifestyle behaviors such as eating nutritious foods and being physically active can lead to a longer and more productive life. These behaviors can also prevent the harmful effects of obesity and many chronic diseases. Forming healthy behaviors during childhood is especially important to future health. For immigrants, offering traditional foods like the fruits and vegetables of their homelands can also help them develop and retain healthy food habits.

Rates of overweight and obesity continue to increase for both adults and children in the United States. Although the causes are complex and not fully understood, effective strategies that help people increase physical activity and choose

healthy foods, both at home and away from home, can help. Hunger is another contemporary issue often associated with obesity. Low-income populations frequently turn to calorie-dense but low-nutrient foods when their food resources are limited. These tend to be inexpensive but satisfying. Families need guidance to get the most nutrition from their limited resources in order for their children to grow and thrive.

Overweight, obesity and lack of physical activity also increase risks of heart disease, diabetes, stroke, hypertension, and some types of cancers. Collectively these chronic diseases account for nearly two out of every three deaths in the Unites States and cost many billions of dollars in health care, lost productivity, and premature death. Despite the cost, these diseases are also among the most preventable through lifestyle changes. To address these problems and help people to make the necessary lifestyle changes, we need to better understand how food-based nutrition interacts with digestive processes and related health and medical conditions. We also need to create resources and programs that are sensitive to the specific cultures and diverse needs of the people we work with and effectively provide the education and skills needed to help them make healthier choices over the life course.

The Center for Agriculture has identified the following research and extension priorities for addressing obesity for children and families in Massachusetts:

1) Improve the food consumption patterns of children and families for more balanced nutrition

2) Develop new ways to promote physical activity for children and families

3) Develop approaches to enhance family and youth decision-making skills as they apply to eating and health.

4) Understand interactions among nutrition related health concerns.

**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 for nutrition education programs will be sustained
The MA Center for Agriculture continues to make strategic investments in programs that address youth obesity
The MA Center for Agriculture will support the development of health education programs.
UMass faculty will collaborate with the Center for Agriculture to seek new funding sources
The MA Center for Agriculture will develop joint research and outreach projects that provide opportunities for graduate students' thesis and field experience.

**2. Ultimate goal(s) of this Program**

Individuals and families make informed, science-based decisions about food and physical activity that affect their long term health and well-being

## 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 |

| Year | Extension | | Research | |
|---|---|---|---|---|
| | 1862 | 1890 | 1862 | 1890 |
| 2011 | 46.6 | 0.0 | 0.0 | 0.0 |
| 2012 | 46.0 | 0.0 | 0.0 | 0.0 |
| 2013 | 46.0 | 0.0 | 0.0 | 0.0 |
| 2014 | 46.0 | 0.0 | 0.0 | 0.0 |
| 2015 | 46.0 | 0.0 | 0.0 | 0.0 |

## V(F). Planned Program (Activity)

### 1. Activity for the Program

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

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

**Extension**

| Direct Methods | Indirect Methods |
|---|---|
| ● Education Class<br>● Workshop<br>● Demonstrations | ● Newsletters<br>● Web sites |

### 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)

### 1. Standard output measures

**Target for the number of persons(contacts) to be reached through direct and indirect contact methods**

| | Direct Contact Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2011 | 8650 | 54000 | 59000 | 15500 |
| 2012 | 8650 | 54000 | 59000 | 15500 |
| 2013 | 8650 | 54000 | 59000 | 15500 |
| 2014 | 8650 | 54000 | 59000 | 15500 |

| | Direct Contact Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2015 | 8650 | 54000 | 59000 | 15500 |

**2. (Standard Research Target) Number of Patent Applications Submitted**

**2011:**0 **2012:**0 **2013:**0 **2014:**0 **2015:**0

**3. Expected Peer Review Publications**

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2011 | 2 | 0 | 0 |
| 2012 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 |
| 2014 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 0 |

## V(H). State Defined Outputs

**1. Output Target**

- Demonstrations

  **2011:**106 **2012:**106 **2013:**106 **2014:**106 **2015:**106

- Displays and Exhibits

  **2011:**390 **2012:**390 **2013:**390 **2014:**390 **2015:**390

- Printed Materials

  **2011:**4 **2012:**4 **2013:**4 **2014:**4 **2015:**4

- Single day workshop, presentation or event

  **2011:**600 **2012:**600 **2013:**600 **2014:**600 **2015:**600

- Workshop series or educational course

  **2011:**2300 **2012:**2300 **2013:**2300 **2014:**2300 **2015:**2300

## V(I). State Defined Outcome

| O. No. | Outcome Name |
|---|---|
| 1 | Participants gain knowledge and skill to improve dietary behaviors |
| 2 | Participants improve dietary behaviors |
| 3 | Participants gain knowledge and skill to improve physical activity behaviors |
| 4 | Participants improve physical activity behaviors |
| 5 | Participants gain knowledge and skill to improve food resource management behaviors |
| 6 | Participants improve food resource management behaviors |
| 7 | Proportion of participants who gain knowledge and skill to improve dietary behaviors |
| 8 | Proportion of participants who use effective nutrition education resources and materials |

**Outcome #** 1

**1. Outcome Target**

Participants gain knowledge and skill to improve dietary behaviors

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**1000 | **2012:**1000 | **2013:**1000 | **2014:**1000 | **2015:**1000 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 2

**1. Outcome Target**

Participants improve dietary behaviors

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**500 | **2012:**500 | **2013:**500 | **2014:**500 | **2015:**500 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 3

**1. Outcome Target**

Participants gain knowledge and skill to improve physical activity behaviors

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**1000 | **2012:**1000 | **2013:**1000 | **2014:**1000 | **2015:**1000 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 724 - Healthy Lifestyle

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 4

**1. Outcome Target**

Participants improve physical activity behaviors

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**500 | **2012:**500 | **2013:**500 | **2014:**500 | **2015:**500 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 724 - Healthy Lifestyle

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 5

**1. Outcome Target**

Participants gain knowledge and skill to improve food resource management behaviors

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**400 | **2012:**400 | **2013:**400 | **2014:**400 | **2015:**400 |
|---|---|---|---|---|

**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 #** 6

**1. Outcome Target**

Participants improve food resource management behaviors

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**200 | **2012:**200 | **2013:**200 | **2014:**200 | **2015:**200 |
|---|---|---|---|---|

**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 #** 7

**1. Outcome Target**

Proportion of participants who gain knowledge and skill to improve dietary behaviors

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**80 | **2012:**80 | **2013:**80 | **2014:**80 | **2015:**80 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 8

**1. Outcome Target**

Proportion of participants who use effective nutrition education resources and materials

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**140 | **2012:**140 | **2013:**140 | **2014:**140 | **2015:**140 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 703 - Nutrition Education and Behavior

**4. Associated Institute Type(s)**

- 1862 Extension

## V(J). Planned Program (External Factors)

**1. External Factors which may affect Outcomes**

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

**Description**

{NO DATA ENTERED}

## V(K). Planned Program (Evaluation Studies and Data Collection)

### 1. Evaluation Studies Planned

**Description**

{NO DATA ENTERED}

### 2. Data Collection Methods

**Description**

{NO DATA ENTERED}

## V(A). Planned Program (Summary)

**Program # 6**

**1. Name of the Planned Program**

Economic Development

**2. Brief summary about Planned Program**

Massachusetts has more than 5,000 firms involved in plant production, retail and landscape services in the agricultural green industries. More than 68,000 individual are employed by these industries and an estimated 14,000 additional workers are needed. Agricultural green industries provide employment opportunities, income, products and services that support our local economies and meet the diverse needs of our citizens. Landscapers, arborists, nurseries, lawn services, greenhouses and livestock farms also play an important role in helping to manage our natural resources and maintain open space. The long-term vitality of this sector of our economy is dependent on an educated and reliable workforce that can operate agricultural businesses and manage landscapes in a manner that is both economically profitable and environmentally sustainable.

The Massachusetts Center for Agriculture supports agricultural green industry professionals through applied research and educational programs that help businesses to thrive and inform policy decisions in Massachusetts. Innovative practices that improve competitiveness while minimizing environmental and human health risks are disseminated to more than 10,000 agricultural and landscape professionals each year through technical education programs and resources. Businesses and communities benefit from the discovery and adoption of technologies that reduce the cost of agricultural production and management, reduce the risks of contamination, increase marketability, and improve the health of soil, air and water. A healthy and sustainable agricultural green industry sector provides economic development and other critical public benefits while preserving natural resources and community character for current and future generations. The Massachusetts Center for Agriculture also supports dairy, livestock and equine industries with research and education important locally and nationally on animal diseases, vaccines, reproduction and nutrition.

**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 :** 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 | 20% | | 0% | |
| 123 | Management and Sustainability of Forest Resources | 0% | | 5% | |
| 133 | Pollution Prevention and Mitigation | 10% | | 0% | |
| 204 | Plant Product Quality and Utility (Preharvest) | 10% | | 0% | |
| 205 | Plant Management Systems | 10% | | 0% | |
| 211 | Insects, Mites, and Other Arthropods Affecting Plants | 0% | | 1% | |
| 216 | Integrated Pest Management Systems | 20% | | 0% | |
| 304 | Animal Genome | 0% | | 3% | |
| 305 | Animal Physiological Processes | 0% | | 9% | |
| 311 | Animal Diseases | 0% | | 38% | |
| 312 | External Parasites and Pests of Animals | 0% | | 37% | |
| 601 | Economics of Agricultural Production and Farm Management | 20% | | 0% | |
| 603 | Market Economics | 0% | | 1% | |
| 605 | Natural Resource and Environmental Economics | 10% | | 3% | |
| 722 | Zoonotic Diseases and Parasites Affecting Humans | 0% | | 1% | |
| 801 | Individual and Family Resource Management | 0% | | 1% | |
| 802 | Human Development and Family Well-Being | 0% | | 1% | |
| | **Total** | 100% | | 100% | |

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

#### 1. Situation and priorities

According to the New England Nursery Association, Massachusetts has more than 5,100 firms involved in production, retail and landscape services in the agricultural green industries. In 2007 the income generated by these businesses was in excess of $2.6 billion. More than 68,000 individual are employed by these industries in Massachusetts and an estimated 14,000 additional workers are needed. The long-term sustainability of these businesses is largely dependent on the stewardship and preservation of the natural resources (land, soil and water) upon which they rely. At the same time, healthy agricultural green industries contribute to the economic vitality and the quality and aesthetic character of life in Massachusetts.

Maintaining a healthy local economy, while conserving natural resources, is a major concern for many communities in Massachusetts. The Massachusetts Center for Agriculture supports economic development in the agricultural green industries through educational programs, informing policy decisions, and generating applied research that is critical for helping businesses in Massachusetts improve their competitiveness while minimizing environmental and human health risks. Businesses and communities benefit from the development and adoption of technologies that reduce the cost of crop production and management, reduce the risks of contamination, increase marketability, and improve the health of soil, air and water. Thriving agricultural green industries can provide economic development and other critical public benefits while

preserving natural resources and community character for current and future generations.

The Center for Agriculture has identified the following research and extension priorities for addressing Economic Development in Massachusetts:

1) Profitable Plant Production and Management - Firms can enhance their efficiencies and expand their market opportunities, tapping into a tremendous statewide growth potential for their products and services. New business owners need support and education to help them develop successful enterprises and sustain the profitability of the industry.

2) Integrated Pest Management (IPM) - Extension Educators and UMass Faculty are recognized nationally for the development and promotion of IPM practices. IPM is a systems approach based on accurate pest identification and monitoring and suitable control measures in an ecologically compatible manner, to maintain pest population levels below those causing economically-significant injury. The use of IPM in the agricultural green industries with new tools developed for accurate identification of pests and methods of biological pest control can reduce management and production costs, reduce the risk of environmental contamination, increase marketability, and improve the health of soil and water.

3) Workforce Development - Workers in the agricultural green industries need research and training opportunities to help them operate their businesses efficiently and in ways that are safe for both people and the environment.

4) Enhanced animal agriculture through management of diseases, reproduction and nutrition.

**2. Scope of the Program**

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

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

**1. Assumptions made for the Program**

Staffing Levels will remain relatively stable
The MA Center for Agriculture will work effectively with partner organizations to achieve this plan
The rate of development in Massachusetts will remain the same or continue to increase
There will continue to be faculty capacity to partner with in developing applied research projects
Agricultural green industry businesses will help maintain open space and public benefit in the face of increasing real estate values

**2. Ultimate goal(s) of this Program**

Agricultural, dairy, livestock and equine industrial sectors will provides economic development and other critical public benefits while preserving natural resources and community character for current and future generations

## 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 |
| 2011 | 14.2 | 0.0 | 4.0 | 0.0 |
| 2012 | 14.0 | 0.0 | 4.0 | 0.0 |
| 2013 | 14.0 | 0.0 | 4.0 | 0.0 |
| 2014 | 14.0 | 0.0 | 4.0 | 0.0 |
| 2015 | 14.0 | 0.0 | 4.0 | 0.0 |

## V(F). Planned Program (Activity)

### 1. Activity for the Program

Basic and applied research
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
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<br>● Workshop<br>● Demonstrations | ● Newsletters<br>● Web sites |

### 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)

### 1. Standard output measures

**Target for the number of persons(contacts) to be reached through direct and indirect contact methods**

| | Direct Contact Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2011 | 24000 | 300000 | 0 | 0 |
| 2012 | 24000 | 300000 | 0 | 0 |
| 2013 | 24000 | 300000 | 0 | 0 |
| 2014 | 24000 | 300000 | 0 | 0 |
| 2015 | 24000 | 300000 | 0 | 0 |

### 2. (Standard Research Target) Number of Patent Applications Submitted

**2011:**0 **2012:**0 **2013:**0 **2014:**0 **2015:**1

### 3. Expected Peer Review Publications

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2011 | 18 | 0 | 0 |
| 2012 | 18 | 0 | 0 |
| 2013 | 18 | 0 | 0 |
| 2014 | 18 | 0 | 0 |
| 2015 | 18 | 0 | 0 |

## V(H). State Defined Outputs

### 1. Output Target

- Demonstrations

**2011:**4 **2012:**4 **2013:**4 **2014:**4 **2015:**4

- Displays and Exhibits

**2011:**1 **2012:**1 **2013:**1 **2014:**1 **2015:**1

- Facilitated Group Meetings and Conferences

**2011:**80 **2012:**80 **2013:**80 **2014:**80 **2015:**80

- Individual Consultations and Site Visits

**2011:**400 **2012:**400 **2013:**400 **2014:**400 **2015:**400

- Printed Materials

**2011:**50 **2012:**50 **2013:**50 **2014:**50 **2015:**50

- Published Articles (New, Professional and Trade)

**2011:**14 **2012:**14 **2013:**14 **2014:**14 **2015:**14

- Single day workshop, presentation or event

**2011:**19 **2012:**19 **2013:**19 **2014:**19 **2015:**19

- Survey or needs assessment

**2011:**4 **2012:**4 **2013:**4 **2014:**4 **2015:**4

- Websites or other computer-based delivery

**2011:**100 **2012:**100 **2013:**100 **2014:**100 **2015:**100

- Workshop series or educational course

**2011:**45 **2012:**45 **2013:**45 **2014:**45 **2015:**45

- Diagnostic Services

**2011:**23000 **2012:**23000 **2013:**23000 **2014:**23000 **2015:**23000

**V(I). State Defined Outcome**

| O. No. | Outcome Name |
|---|---|
| 1 | Participants acquire knowledge and skill in environmentally sustainable practices for operating agricultural green industry businesses |
| 2 | Participants adopt environmentally sustainable practices for operating agricultural green industry businesses |
| 3 | Participants acquire the knowledge and skill to lower the risk from and exposure to pesticides and fertilizers |
| 4 | Participants adopt practices that lower the risk from and exposure to pesticides and fertilizers |
| 5 | Participants acquire the knowledge and skill to reduce the risk of exotic pests, diseases and invasive species |
| 6 | Participants adopt practices that reduce the risk of exotic pests, diseases and invasive species |
| 7 | Participants acquire the knowledge and skills for practices that increase the economic viability of agricultural green industry businesses |
| 8 | Participants adopt practices that that increase the economic viability of agricultural green industry businesses |
| 9 | Accurate research on Animal Diseases |
| 10 | Accurate research on natural resource policies produced and disseminated |

**Outcome #** 1

**1. Outcome Target**

Participants acquire knowledge and skill in environmentally sustainable practices for operating agricultural green industry businesses

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**500 | **2012:**500 | **2013:**500 | **2014:**500 | **2015:**500 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 111 - Conservation and Efficient Use of Water
- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 2

**1. Outcome Target**

Participants adopt environmentally sustainable practices for operating agricultural green industry businesses

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**200 | **2012:**200 | **2013:**200 | **2014:**200 | **2015:**200 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 111 - Conservation and Efficient Use of Water
- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 3

**1. Outcome Target**

Participants acquire the knowledge and skill to lower the risk from and exposure to pesticides and fertilizers

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**500 | **2012:**500 | **2013:**500 | **2014:**500 | **2015:**500 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 133 - Pollution Prevention and Mitigation
- 216 - Integrated Pest Management Systems

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 4

**1. Outcome Target**

Participants adopt practices that lower the risk from and exposure to pesticides and fertilizers

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**200 | **2012:**200 | **2013:**200 | **2014:**200 | **2015:**200 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 133 - Pollution Prevention and Mitigation
- 216 - Integrated Pest Management Systems

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 5

**1. Outcome Target**

Participants acquire the knowledge and skill to reduce the risk of exotic pests, diseases and invasive species

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**200 | **2012:**200 | **2013:**200 | **2014:**200 | **2015:**200 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 6

**1. Outcome Target**

Participants adopt practices that reduce the risk of exotic pests, diseases and invasive species

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**100 | **2012:**100 | **2013:**100 | **2014:**100 | **2015:**100 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 7

**1. Outcome Target**

Participants acquire the knowledge and skills for practices that increase the economic viability of agricultural green industry businesses

**2. Outcome Type :** Change in Knowledge Outcome Measure

| | | | | |
|---|---|---|---|---|
| **2011:**200 | **2012:**200 | **2013:**200 | **2014:**200 | **2015:**200 |

**3. Associated Knowledge Area(s)**

- 204 - Plant Product Quality and Utility (Preharvest)
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 8

**1. Outcome Target**

Participants adopt practices that that increase the economic viability of agricultural green industry businesses

**2. Outcome Type :** Change in Action Outcome Measure

| | | | | |
|---|---|---|---|---|
| **2011:**100 | **2012:**100 | **2013:**100 | **2014:**100 | **2015:**100 |

**3. Associated Knowledge Area(s)**

- 204 - Plant Product Quality and Utility (Preharvest)
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 9

**1. Outcome Target**

Accurate research on Animal Diseases

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**1 | **2012:**0 | **2013:**0 | **2014:**0 | **2015:**0 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 312 - External Parasites and Pests of Animals
- 722 - Zoonotic Diseases and Parasites Affecting Humans

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome #** 10

**1. Outcome Target**

Accurate research on natural resource policies produced and disseminated

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**1 | **2012:**0 | **2013:**0 | **2014:**0 | **2015:**0 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 603 - Market Economics
- 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 (Evaluation Studies and Data Collection)

### 1. Evaluation Studies Planned

**Description**

{NO DATA ENTERED}

### 2. Data Collection Methods

**Description**

{NO DATA ENTERED}

## V(A). Planned Program (Summary)

**Program # 7**

**1. Name of the Planned Program**

Youth Development

**2. Brief summary about Planned Program**

Citizens in Massachusetts are appropriately concerned about preparing youth for the challenges of the 21st century. While this concern is understandably focused on academic achievement, young people also need to develop knowledge, skills, and attitudes for good health, environmental stewardship, creative expression, and community service. Young people 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 additional to well-designed opportunities to share their expertise and passions with youth in ways that will enable them to grow up to become better citizens, workers, neighbors, and parents.

UMass Extension youth devolvement programs are grounded in positive youth development principles. They ensure safe, inclusive environments as well as opportunities for mastery and active participation. Our 1,600 statewide volunteers provide recreational and social activities during out of school time that are fun and educational. Our longstanding clubs and camps are complemented by innovative program that respond to a national 4-H mandate for educational enrichment in science and technology. We also target youth from low-resource communities and from families confronting the challenges of military deployment, helping caring adults to reach diverse youth and cultivate skills that are critical for future success and active citizenship.

**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**

Positive youth development experiences are connected to decreases in negative behaviors such as alcohol use, tobacco use and violence, and increases in positive attitudes and behaviors. According to a report commissioned by the Nellie Mae Education Foundation (2004), youth who participated in programming during the afterschool hours exhibited a greater interest in learning and achieved higher academic performance. The report also stated that programming did not have to be school-based. It could be of any format, such as 4-H clubs, community groups, Boys & Girls Clubs, etc., as long as programs were well-run, of high quality and actively involved youth participants. Youth development programs can approach enhancing youth experiences in a variety of ways including mentoring, academic achievement-oriented programs and civic engagement.

For any approach to be effective, it must be grounded in positive youth development principles. These principles suggest that all youth must have a combination of the following: access to resources that promote optimal physical and mental health; nurturing relationships with adults and positive relationships with peers; safe places for living, learning and working; educational and economic opportunity; and structured activities and the opportunity for community service and civic participation (MA Department of Public Health, 2003). According to a National report entitled Eight Essential Elements for 4-H, (1999) effective youth programs must also ensure inclusive environments for all youth, as well as opportunities for mastery and active participation in determining one's future.

UMass Extension includes both university-based and community-based program elements as a means to strengthen the University's outreach to youth with the following program priorities:

1) Life Skills - From communication skills, to recordkeeping, from teamwork to valuing diversity, Massachusetts youth need a wide variety of life skills to grow into competent, caring, capable, engaged, and well-informed citizens prepared to work and live in the 21st century. Through community service, a Massachusetts 4-H program emphasis area youth will become better engaged citizens. This civic engagement offers youth the opportunity to view life in a different way and better understand the skill set that is needed to enable them to become our future leaders. UMass Extension has been working in the area of youth development for over 100 years. Staff have demonstrated that they have the knowledge and skills to work effectively with adults who work or volunteer with youth. They understand youth development best practices. They are members of various collaborations, many in urban communities. They are beginning to build a presence on the UMass campus. With the current level of staffing, however, and the realization that additional staffing may not be forthcoming, training other adults who work or volunteer in the field is a key strategy.

2) Science, Technology, Engineering, and Math - An area of great need that has been identified by the National Association of State Universities and Land-Grant Colleges, National 4-H Council, and UMass Extension 4-H is in the areas of Science, Technology, Engineering, and Math education (STEM) and its impact on preparing a globally competitive workforce. Through its extensive volunteer and Extension staff network throughout the state, the Massachusetts 4-H Program is uniquely positioned in Massachusetts to assist in delivering quality educational STEM programs in out-of-school time settings. National 4-H's Curriculum System provide a rich and diverse set of juried research, curricula and evaluative methodologies developed by faculty throughout the national CSREES system. Hands-on, real world experiences delivered in both informal and formal settings are appealing to many parents and youth and have a proven track record in promoting self-efficacy, community awareness and responsibility in youth participating in its programs.

3) Animal Science - Animal science activities account for approximately 75% of the entire 4-H program in Massachusetts, engaging over 2,250 youth annually. 4-H youth who participate in animal projects are often asked to represent the state at national conferences, and many win awards. Building upon the strength of our existing programs, the Massachusetts 4-H Animal Science Program is also expanding into urban areas in an effort to increase the involvement of urban youth in the study of animal science.

4) Environmental Science and Stewardship - The concept of scientific stewardship of natural resources is at the heart of the land grant mission, and youth programs have always played a part in this outreach. Currently, our major environmental science and stewardship efforts are the Massachusetts Envirothon/CNRE collaboration and the Beachcomber trailer. Results from our recent stakeholder survey underscore the public's expectation of a UMass and Extension presence in environmental education. These environmental education programs for youth draw on a strong teaching base at UMass Amherst, particularly in the College of Natural Resources and Environment and the School of Education. Demonstrated faculty/staff interest includes urban forestry and water resources, and community-based and project-based science education. Staff engaged in environmental youth development efforts have also cultivated strong collaborations outside the University and with environmental agencies and NGOs. Current environmental stewardship programs are leaders in the area of youth development outcomes measurement for UMass Extension. These programs are also experienced and well positioned in terms of outreach to diverse, urban audiences. Research for Extension's 07-11 plan also uncovered potential to link with nutrition, agriculture, and youth development goals through gardening programs.

**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 are stable
There is support for staff development
The University and Extension recognize an organization-wide commitment to youth development
Resources are available for faculty involvement in youth programs for the purpose of providing subject matter, outreach and teaching
Staff will incorporate strategies and tactics of the 4-H strategic plan into their 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 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 |
| 2011 | 11.6 | 0.0 | 0.0 | 0.0 |
| 2012 | 11.6 | 0.0 | 0.0 | 0.0 |
| 2013 | 11.6 | 0.0 | 0.0 | 0.0 |
| 2014 | 11.6 | 0.0 | 0.0 | 0.0 |
| 2015 | 11.6 | 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
Displays and Exhibits
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

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

**Extension**

| Direct Methods | Indirect Methods |
|---|---|

| | |
|---|---|
| ● Education Class<br>● Workshop<br>● Group Discussion<br>● One-on-One Intervention<br>● Demonstrations | ● Newsletters<br>● Web sites |

**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)

**1. Standard output measures**

**Target for the number of persons(contacts) to be reached through direct and indirect contact methods**

| | Direct Contact Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2011 | 520 | 7000 | 14000 | 8000 |
| 2012 | 520 | 7000 | 14000 | 8000 |
| 2013 | 520 | 7000 | 14000 | 8000 |
| 2014 | 520 | 7000 | 14000 | 8000 |
| 2015 | 520 | 7000 | 14000 | 8000 |

**2. (Standard Research Target) Number of Patent Applications Submitted**

**2011:**0 **2012:**0 **2013:**0 **2014:**0 **2015:**0

**3. Expected Peer Review Publications**

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2011 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 |
| 2014 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 0 |

## V(H). State Defined Outputs

### 1. Output Target

- 4-H Clubs

**2011:**360 **2012:**360 **2013:**360 **2014:**360 **2015:**360

- Community Service Project

**2011:**30 **2012:**30 **2013:**30 **2014:**30 **2015:**30

- Curricula/Instructional Materials

**2011:**2 **2012:**2 **2013:**2 **2014:**2 **2015:**2

- Displays and Exhibits

**2011:**110 **2012:**110 **2013:**110 **2014:**110 **2015:**110

- Facilitated Group Meetings and Conferences

**2011:**92 **2012:**92 **2013:**92 **2014:**92 **2015:**92

- Individual Consultations and Site Visits

**2011:**60 **2012:**60 **2013:**60 **2014:**60 **2015:**60

- Printed Materials

**2011:**115 **2012:**115 **2013:**115 **2014:**115 **2015:**115

- Single day workshop, presentation or event

**2011:**70 **2012:**70 **2013:**70 **2014:**70 **2015:**70

- Websites or other computer-based delivery

**2011:**2 **2012:**2 **2013:**2 **2014:**2 **2015:**2

- Workshop series or educational course

**2011:**430 **2012:**430 **2013:**430 **2014:**430 **2015:**430

## V(I). State Defined Outcome

| O. No. | Outcome Name |
|---|---|
| 1 | Youth are effective team members, communicators, and leaders |
| 2 | Youth increase knowledge and skill in science, engineering and technology |
| 3 | Youth engage in community service |
| 4 | Youth adopt behaviors that will help them succeed academically and in the workplace |

**Outcome #** 1

**1. Outcome Target**

Youth are effective team members, communicators, and leaders

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**500 | **2012:**500 | **2013:**500 | **2014:**500 | **2015:**500 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 2

**1. Outcome Target**

Youth increase knowledge and skill in science, engineering and technology

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**800 | **2012:**800 | **2013:**800 | **2014:**800 | **2015:**800 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 3

**1. Outcome Target**

Youth engage in community service

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**200 | **2012:**200 | **2013:**200 | **2014:**200 | **2015:**200 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 4

**1. Outcome Target**

Youth adopt behaviors that will help them succeed academically and in the workplace

**2. Outcome Type :** Change in Action Outcome Measure

| | | | | |
|---|---|---|---|---|
| **2011:**100 | **2012:**100 | **2013:**100 | **2014:**100 | **2015:**100 |

**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 (Evaluation Studies and Data Collection)

**1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)

**Description**

{NO DATA ENTERED}

**2. Data Collection Methods**

- Sampling
- Whole population
- On-Site

**Description**

Focus groups
Pre/post surveys
Self-reports
4-H Records
School records
Anecdotal responses

## V(A). Planned Program (Summary)

**Program # 8**

**1. Name of the Planned Program**

Environmental Stewardship

**2. Brief summary about Planned Program**

Environmental Stewardship is increasingly viewed as both an ethical and economic imperative. There is a critical need for understanding of the current threats to water resources, biodiversity and ecosystem integrity accompanied by the development and implementation of best management practices that will protect terrestrial, wetland, aquatic and coastal ecosystems. There is also a need for land use policies that recognize both the vulnerability of natural resources and our reliance on them. At the same time, management decisions cannot always wait for a complete understanding of potential impacts without risking the loss of ecosystems and species. The Center for Agriculture at the University of Massachusetts Amherst can play a critical role in the development and deployment of new approaches and tools based on an evolving scientific understanding of both ecological and human systems.

UMass Extension and the Massachusetts Agricultural Experiment Station utilize the scientific expertise of UMass Amherst academic departments to develop educational opportunities, analytic tools and approaches for enhancing environmental stewardship. Programs are also specifically designed to facilitate communication and partnerships among various individuals, groups and agencies engaged in conservation and environmental education. Academic expertise in environmental science and conservation is applied to training and technical assistance efforts that strengthen the capacity within communities to identify and effectively address natural resource issues. Expertise and research capacity in regional land use, watershed and open space planning are used to create comprehensive, continuing education and training programs for local officials, natural resource professionals and educators. The Center for Agriculture programs and resources enable Massachusetts citizens to make informed decisions and take actions to preserve or enhance the quality of our natural resources and ecosystems.

**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 | 0% | | 27% | |
| 112 | Watershed Protection and Management | 0% | | 1% | |
| 123 | Management and Sustainability of Forest Resources | 15% | | 0% | |
| 124 | Urban Forestry | 0% | | 5% | |
| 131 | Alternative Uses of Land | 15% | | 1% | |
| 133 | Pollution Prevention and Mitigation | 15% | | 4% | |
| 135 | Aquatic and Terrestrial Wildlife | 15% | | 0% | |
| 136 | Conservation of Biological Diversity | 15% | | 0% | |
| 211 | Insects, Mites, and Other Arthropods Affecting Plants | 0% | | 23% | |
| 212 | Pathogens and Nematodes Affecting Plants | 0% | | 23% | |
| 605 | Natural Resource and Environmental Economics | 0% | | 8% | |
| 608 | Community Resource Planning and Development | 15% | | 0% | |
| 609 | Economic Theory and Methods | 0% | | 8% | |
| 723 | Hazards to Human Health and Safety | 10% | | 0% | |
| | **Total** | 100% | | 100% | |

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

**1. Situation and priorities**

**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 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

Staff with expertise in invasive species management will be needed to carry out many of the listed activities for this issue.

Collaborative efforts between extension and experiment station staff and faculty will result in better opportunities for grants to be funded.

We will have well established networks of professional staff, faculty and other university resources in agriculture and the green industry, 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.

Given the strong regulations in Massachusetts protecting wetlands and endangered species, people will be motivated to change practices that concern this issue.

Staff will continue to develop necessary knowledge and skills to operate on the cutting edge of this issue.

**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 |
| 2011 | 8.8 | 0.0 | 2.6 | 0.0 |
| 2012 | 8.0 | 0.0 | 2.6 | 0.0 |
| 2013 | 8.0 | 0.0 | 2.6 | 0.0 |
| 2014 | 8.0 | 0.0 | 2.6 | 0.0 |
| 2015 | 8.0 | 0.0 | 2.6 | 0.0 |

## V(F). Planned Program (Activity)

**1. Activity for the Program**

Basic and applied research
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

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

**Extension**

| Direct Methods | Indirect Methods |
|---|---|
| • Education Class<br>• Workshop | • Newsletters<br>• Web sites |

### 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)

### 1. Standard output measures

**Target for the number of persons(contacts) to be reached through direct and indirect contact methods**

| | Direct Contact Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2011 | 1900 | 104000 | 0 | 0 |
| 2012 | 1900 | 104000 | 0 | 0 |
| 2013 | 1900 | 104000 | 0 | 0 |
| 2014 | 1900 | 104000 | 0 | 0 |
| 2015 | 1900 | 104000 | 0 | 0 |

### 2. (Standard Research Target) Number of Patent Applications Submitted

**2011:**0 **2012:**0 **2013:**0 **2014:**0 **2015:**0

### 3. Expected Peer Review Publications

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2011 | 27 | 2 | 0 |
| 2012 | 27 | 2 | 0 |
| 2013 | 27 | 2 | 0 |
| 2014 | 27 | 2 | 0 |
| 2015 | 27 | 2 | 0 |

## V(H). State Defined Outputs

### 1. Output Target

- Analytic Tools and Techniques

  **2011:**4 **2012:**4 **2013:**4 **2014:**4 **2015:**4

- Diagnostic Services

  **2011:**200 **2012:**200 **2013:**200 **2014:**200 **2015:**200

- Facilitated Group Meetings and Conferences

  **2011:**17 **2012:**17 **2013:**17 **2014:**17 **2015:**17

- Printed Materials

  **2011:**6 **2012:**6 **2013:**6 **2014:**6 **2015:**6

- Published Articles (News, Professional and Trade)

  **2011:**8 **2012:**8 **2013:**8 **2014:**8 **2015:**8

- Single day workshop, presentation or event

  **2011:**74 **2012:**74 **2013:**74 **2014:**74 **2015:**74

- Survey or needs assessment

  **2011:**2 **2012:**2 **2013:**2 **2014:**2 **2015:**2

- Websites or other computer-based delivery

  **2011:**12 **2012:**12 **2013:**12 **2014:**12 **2015:**12

- Workshop series or educational course

  **2011:**8 **2012:**8 **2013:**8 **2014:**8 **2015:**8

## V(I). State Defined Outcome

| O. No. | Outcome Name |
|---|---|
| 1 | Participants acquire knowledge and skill to protect and enhance natural resources and ecosystems |
| 2 | Participants adopt practices that protect and enhance natural resources and ecosystems |
| 3 | Participants acquire knowledge and skill for strategic land conservation programs that protect natural resources and ecosystems |
| 4 | Participants implement strategic land conservation programs that protect natural resources and ecosystems |
| 5 | Participants acquire knowledge and skill to implement land-use plans and programs that accommodate development in a manner that protects natural resources and ecosystems |
| 6 | Participants implement land-use plans and programs that accommodate development in a manner that protects natural resources and ecosystems |
| 7 | Participants have the knowledge and skills to promote environmental sustainability through planning and regulation |
| 8 | Participants promote environmental sustainability through planning and regulation |
| 9 | Participants acquire the knowledge and skills to implement pest management practices that minimize the impact on human health |
| 10 | Participants implement pest management practices that minimize the impact on human health |
| 11 | Accurate research to promote Water Quality |
| 12 | Accurate Research on understanding and assessing the functions of open space in the landscape |

**Outcome #** 1

**1. Outcome Target**

Participants acquire knowledge and skill to protect and enhance natural resources and ecosystems

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:** | **2012:** | **2013:** | **2014:** | **2015:** |
|---|---|---|---|---|
| 200 | 200 | 200 | 200 | 200 |

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome #** 2

**1. Outcome Target**

Participants adopt practices that protect and enhance natural resources and ecosystems

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:** | **2012:** | **2013:** | **2014:** | **2015:** |
|---|---|---|---|---|
| 100 | 100 | 100 | 100 | 100 |

**3. Associated Knowledge Area(s)**

- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome #** 3

**1. Outcome Target**

Participants acquire knowledge and skill for strategic land conservation programs that protect natural resources and ecosystems

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:** | **2012:** | **2013:** | **2014:** | **2015:** |
|---|---|---|---|---|
| 150 | 150 | 150 | 150 | 150 |

**3. Associated Knowledge Area(s)**

- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome #** 4

**1. Outcome Target**

Participants implement strategic land conservation programs that protect natural resources and ecosystems

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:** | **2012:** | **2013:** | **2014:** | **2015:** |
|---|---|---|---|---|
| 75 | 75 | 75 | 75 | 75 |

**3. Associated Knowledge Area(s)**

- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 5

**1. Outcome Target**

Participants acquire knowledge and skill to implement land-use plans and programs that accommodate development in a manner that protects natural resources and ecosystems

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:** | **2012:** | **2013:** | **2014:** | **2015:** |
|---|---|---|---|---|
| 150 | 150 | 150 | 150 | 150 |

**3. Associated Knowledge Area(s)**

- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 6

**1. Outcome Target**

Participants implement land-use plans and programs that accommodate development in a manner that protects natural resources and ecosystems

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**75 | **2012:**75 | **2013:**75 | **2014:**75 | **2015:**75 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 7

**1. Outcome Target**

Participants have the knowledge and skills to promote environmental sustainability through planning and regulation

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**120 | **2012:**120 | **2013:**120 | **2014:**120 | **2015:**120 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 131 - Alternative Uses of Land
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome #** 8

**1. Outcome Target**

Participants promote environmental sustainability through planning and regulation

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**40 | **2012:**40 | **2013:**40 | **2014:**40 | **2015:**40 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 131 - Alternative Uses of Land
- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 9

**1. Outcome Target**

Participants acquire the knowledge and skills to implement pest management practices that minimize the impact on human health

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**100 | **2012:**100 | **2013:**100 | **2014:**100 | **2015:**100 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 133 - Pollution Prevention and Mitigation
- 723 - Hazards to Human Health and Safety

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 10

**1. Outcome Target**

Participants implement pest management practices that minimize the impact on human health

**2. Outcome Type :** Change in Action Outcome Measure

| **2011:**50 | **2012:**50 | **2013:**50 | **2014:**50 | **2015:**50 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 133 - Pollution Prevention and Mitigation
- 723 - Hazards to Human Health and Safety

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome #** 11

**1. Outcome Target**

Accurate research to promote Water Quality

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**1 | **2012:**0 | **2013:**0 | **2014:**0 | **2015:**0 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome #** 12

**1. Outcome Target**

Accurate Research on understanding and assessing the functions of open space in the landscape

**2. Outcome Type :** Change in Knowledge Outcome Measure

| **2011:**1 | **2012:**0 | **2013:**0 | **2014:**0 | **2015:**0 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 124 - Urban Forestry

**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

**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 (Evaluation Studies and Data Collection)

### 1. Evaluation Studies Planned

#### Description

{NO DATA ENTERED}

### 2. Data Collection Methods

#### Description

{NO DATA ENTERED}

## 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 and hunger. 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 | 20% | | 0% | |
| 902 | Administration of Projects and Programs | 50% | | 100% | |
| 903 | Communication, Education, and Information Delivery | 30% | | 0% | |
| | **Total** | 100% | | 100% | |

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

**1. Situation and priorities**

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 support 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 for Massachusetts Center for Agriculture Administration are:

Support the Center's research and educational mission through program support and administrative services
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
Promote ease of access to center programs and services for diverse communities and individuals throughout

Massachusetts
Staff Development - build personal and team skills for increased organizational effectiveness
Strategic Planning and Program Development

**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 |
| 2011 | 7.3 | 0.0 | 1.5 | 0.0 |
| 2012 | 7.3 | 0.0 | 1.5 | 0.0 |
| 2013 | 7.3 | 0.0 | 1.5 | 0.0 |
| 2014 | 7.3 | 0.0 | 1.5 | 0.0 |
| 2015 | 7.3 | 0.0 | 1.5 | 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 the farms
Website and Other Computer-based delivery
Printed Material
Planning and Integration

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

**Extension**

| Direct Methods | Indirect Methods |
|---|---|
| ● Other 1 (Administration) | ● Newsletters<br>● Web sites |

### 3. Description of targeted audience

Administrators
Growers
Food Industry
Agriculturists

## V(G). Planned Program (Outputs)

### 1. Standard output measures

**Target for the number of persons(contacts) to be reached through direct and indirect contact methods**

| | Direct Contact Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2011 | 300 | 1000 | 0 | 0 |
| 2012 | 300 | 1000 | 0 | 0 |
| 2013 | 300 | 1000 | 0 | 0 |
| 2014 | 300 | 1000 | 0 | 0 |
| 2015 | 300 | 1000 | 0 | 0 |

### 2. (Standard Research Target) Number of Patent Applications Submitted

**2011:**0 **2012:**0 **2013:**0 **2014:**0 **2015:**0

### 3. Expected Peer Review Publications

| Year | Research Target | Extension Target | Total |
|---|---|---|---|
| 2011 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 |
| 2014 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 0 |

## V(H). State Defined Outputs

### 1. Output Target

- Administrative Initiatives, Systems and Procedures

**2011:**0 **2012:**0 **2013:**0 **2014:**0 **2015:**0

## 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

| **2011:**0 | **2012:**0 | **2013:**0 | **2014:**0 | **2015:**0 |
|---|---|---|---|---|

**3. Associated Knowledge Area(s)**

- 901 - Program and Project Design,  and Statistics
- 902 - Administration of Projects and Programs
- 903 - Communication, Education, and Information Delivery

**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 consolidation of the Experiment Station and Extension under the Center for Agriculture seems to be progressing nicely.  We have great enthusiasm that being partnered again under the same college, we will weather the current economic storm and help move agribusiness, youth issues, food safety and security, energy and environmental issues forward in Massachusetts.

## V(K). Planned Program (Evaluation Studies and Data Collection)

**1. Evaluation Studies Planned**

**Description**

{NO DATA ENTERED}

**2. Data Collection Methods**

### Description

{NO DATA ENTERED}