2013 University of Massachusetts Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

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

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

The mission of UMass Extension is to improve the health, well-being and security of youth, families and communities; conserve and enhance natural resources; and strengthen agriculture and food systems. We fulfill that mission by utilizing the research and teaching capacity of the University of Massachusetts Amherst to generate and communicate knowledge while creating approaches, methods, and tools for solving problems. UMass Extension links the Massachusetts land grant university with a larger community of people in collaborative partnerships to address issues of fundamental importance to the people of Massachusetts, New England, and the nation. UMass Extension addresses public concerns of high priority for the Commonwealth. Part of the national Cooperative Extension System, UMass Extension sponsors statewide programs in Agriculture and Landscape, Natural Resources and Environmental Conservation, Nutrition Education and the Massachusetts 4-H Youth Development. These programs, often in partnerships with other organizations, offer research and educational opportunities including workshops, conferences, distance education, training events, consultations, and applied research.

The National Institute of Food and Agriculture has specified five key areas which help us to organize the Center's work. These are: Global Food Security; Climate Change; Sustainable Energy; Food Safety; and Childhood Obesity. Center programs are also focused in three additional areas: Agricultural Economic Development; Youth Development; and Environmental Stewardship.

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

Climate Change - Massachusetts growers must meet the formidable challenges posed by the increasing demand for locally produced food against the backdrop of a changing climate. Local crop and animal agricultural systems must be conscious of energy use and greenhouse gas emissions as well as new opportunities for cultivating crops as alternative energy sources. Individuals, communities and business must be prepared to adapt to unpredictable weather conditions and effectively address the many

challenges posed by our changing climate. The Massachusetts Center for Agriculture will play a key role in generating research and education to sustain a vital agricultural sector and take advantage of emerging benefits and opportunities related to climate change.

Sustainable Energy - Minor variations in the supply and demand for energy can affect agricultural production with significant implications for the health and sustainability of our regional economy. The cost of energy profoundly influences farming practices, management decisions, products and profitability. The Center for Agriculture is an important resource for stimulating innovation in alternative and renewable energy sources. Research and education programs enable consumers to save money and make environmentally sound choices, while minimizing the financial vulnerability of businesses.

Food Safety - Food borne pathogens account for millions of illnesses and thousands of deaths in the United States each year. The annual medical cost of food borne illness in Massachusetts alone is estimated to be over $200 million. Federal agencies have established guidelines for workers and managers in food retail establishments, residential facilities, schools and child care settings. The Massachusetts Center for Agriculture helps growers and businesses meet federal standards. Scientific research, education and certification programs improve practices in all sectors of the food system to ensure the safety of food grown, processed and consumed in Massachusetts.

Childhood Obesity - While childhood obesity rates may finally be declining, obesity remains a critical problem nationally and in Massachusetts. Many of the long-term health problems typically associated with obesity in childhood are reversible but can also lead to obesity in adults. The Massachusetts Center for Agriculture conducts research and community outreach to inform policies and create programs that increase access to local produce, teach families about healthy foods choices, and help children develop more active lifestyles. Nutrition education programs are delivered to families with limited resources through a state wide network of community collaborators, so that healthy habits are established during childhood, reducing the most harmful effects of obesity and leading to healthier and more productive lives.

Agricultural Economic Development - Agricultural businesses provide employment opportunities, income, products and services that support our local economies and meet the diverse needs of our citizens. The long-term vitality of this sector of our economy relies on an educated and competent workforce. The Massachusetts Center for Agriculture supports agricultural economic development through applied research and educational programs that help individuals operate businesses and manage landscapes in ways that are economically sound and environmentally sustainable.

Youth Development - Massachusetts citizens are concerned with preparing youth for the challenges of the 21st century. Young people can only reach their full potential in environments that offer safety, caring adults, and authentic experiences. A state wide network of more than 1,000 4-H volunteers provide leadership training, like-skills development, recreation and community service opportunities for youth during out of school time that are engaging and educational. Longstanding clubs and camps are complemented by innovative program that respond to a national 4-H mandate for educational enrichment in science and technology.

Environmental Stewardship - There is a critical need to better understand current threats to water resources, biodiversity and ecosystem integrity. Land use policies that recognize the vulnerability of natural resources as well as our reliance upon them are also essential. The Center for Agriculture plays a critical role in the development and deployment of innovate approaches and tools that are based on our evolving understanding of ecological and human systems. Scientific investigations are closely interwoven with educational resources that advance disciplinary knowledge, inform policy decisions and promote management practices that protect terrestrial, wetland, aquatic and coastal ecosystems.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	110.7	0.0	28.0	0.0
Actual	97.9	0.0	29.3	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

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

2. Brief Explanation

Massachusetts Agricultural Experiment Station

Proposals for funded research projects proceed through different levels of review. In some cases, prospective faculty investigators collaborate with academic department chairs to propose project ideas. Brief descriptions are sent to the Director of the Agricultural Experiment Station who reviews the basic concept to ensure that it is consistent with the priorities and goals of the Center and NIFA. Prospective investigators then develop a detailed research proposal that is reviewed and approved by the faculty member's academic department chair and three disciplinary peers who comment on the scientific merit. Any necessary revisions are incorporated and final approval of projects is made by the Director of the Agricultural Experiment Station.

The Director of the Agricultural Experiment Station will also solicit research initiatives in specific disciplinary areas or with other criteria, such as future potential for other external funding or integration with extension type work. For these opportunities, a brief pre-proposal is submitted and a committee composed of faculty and professional staff recommends the most promising ideas. Prospective investigators develop a detailed proposal and identify reviewers. The Director will ensure that changes recommended by reviewers are incorporated and will provide funding at the Director's discretion. Funded projects develop detailed assessment plans that will monitor and document the success of the project.

UMass Extension

University of Massachusetts Extension has entered into a formal agreement with Extension in Maine, Vermont, and New Hampshire to develop and implement a four-state, web-based planning and reporting system. Through the on-line system, program staff and administrators can access the content of plans in all four states at the organizational level, the team level and for individuals. Extension administrators from each the four states utilize the system to review work that is occurring across the region. Ongoing monthly telephone meetings with the four states are an opportunity for each of the states to provide feedback on specific programs or on the statewide goals and initiatives. The process of developing this shared system has also resulted in discussions around regional programs, opportunities for multistate work, sharing staff resources and a much better understanding of how each of our unique programs are similar to, and different from, others programs in New England. The four states have agreed to provide periodic formal

and informal merit review and feedback for each state as a component of our partnership. The new system provides access to each state plan of work for all four states, allowing for easy sharing of ideas and opportunities for further collaboration.

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

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged 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.

In Fiscal Year 2012, the Center for Agriculture implemented a comprehensive process of soliciting input from internal and external stakeholders to identify organizational priorities and help us to structure our organization in ways that better serve constituents, while effectively integrating research and applied research with public education, outreach and extension. The process involved a survey administered to hundreds of individuals representing a broad range of citizens, communities organizations, agencies and professional associations. To obtain input from faculty stakeholders, the Center held a series of discussions with collaborating academic departments. The Center also created a process for professional staff and extension faculty to provide input on current organizational needs and future directions. This included sharing results from the stakeholder survey, facilitated planning sessions and the creation of a working group composed of representatives who synthesized information and issued specific recommendations.

In addition to the mechanisms described above, the center continues many of its previous activities designed to obtain input from stakeholders. The Center for Agriculture Advisory Board, consisting of individuals from key Agriculture and Natural Resource organizations across the state helped us to engage traditional stakeholders and develop new relationships, understand new perspectives and build new partnership opportunities. Because the Center for Agriculture resides within the College of Natural Sciences the advisory board of the college also serves in an advisory capacity, primarily regarding the conduct of scientific research funded by the Massachusetts Agricultural Experiment Station. UMass Extension continues its close association with an Extension Board of Public Overseers. As directed by the enabling legislation, UMass Extension meets with the board four times per year and membership on the board is specifically defined in the enabling legislation and appointed by the governor. In the past year, individuals serving on the Extension Board of Public Overseers represented the following agencies, organizations and groups: Massachusetts Farm Bureau; MA 4-H Foundation; Massachusetts Farm Bureau; UMass Donahue Institute; Massachusetts Audubon Society; Massachusetts Arborists Association; Massachusetts State Department of Agricultural Resources; Massachusetts Forest Land Owner Association; Massachusetts Nutrition Board; Massachusetts State 4-H Advisory Council.

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

1. Method to identify individuals and groups

- Use Advisory Committees
- Open Listening Sessions
- Needs Assessments

Brief explanation.

Three hundred sixty-five individuals were identified by program staff as potential respondents for our external stakeholder survey. Our intention was to assess internal and external stakeholders and specific attention was directed towards attempting to obtain feedback from individuals not previously engaged with the Center or extension programming. This approach was largely successful as the following breakdown of 203 survey respondents indicates:

-14% UMass faculty, dean or department head
-31% Center for Ag/UMass Extension staff
-5% Other UMass staff or admin
-7% Advisory Board Member
-43% External Stakeholder, client or collaborator

For "external stakeholder, client or collaborator," 61% described their current involvement with the Center as "none or very little."

Center administrators contacted academic chairs to request time during regularly scheduled faculty meetings. The Center identified and met with those departments with the greatest potential to work in areas defined by our organizational mission as well as the priorities identified by the National Institute of Food and Agriculture. Those departments were: Environmental Conservation, Nutrition, Food Science and the Stockbridge School of Agriculture.

Invitations to participate in a facilitated planning session were sent to all professional staff and extension faculty, and to collaborating academic faculty and department heads. Approximately 70% of those who were invited attended the session. At the session, volunteers and nominations were solicited for individuals interested in continuing to provide input through participation in a working group dedicated to synthesizing information from previous stakeholder engagement efforts and issuing specific recommendations.

The Center continued previous activities designed to obtain input from stakeholders. Formal opportunities to obtain feedback occur during meetings of our Center for Agriculture Advisory Board and when UMass Extension convenes the Extension Board of Public Overseers. Members of the Center Advisory Board are selected to reflect a diverse array of stakeholder groups and state agencies with a shared interest in research and public education in areas related to our mission area. Members of the Extension Board of Public Overseers are specified by the original enabling legislation and approved by the Governor of the state.

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

1. Methods for collecting Stakeholder Input

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

Brief explanation.

In the Fiscal Year 2012, we conducted a survey of internal and external stakeholders that was administered on-line. We had focused conversations with faculty from key collaborating academic departments and we also created a process for professional staff and extension faculty to provide input on current organizational needs and future directions. This included sharing results from the stakeholder survey, facilitated planning sessions and the creation of a working group composed of representatives who synthesized information and issued specific recommendations.

In addition to the activities described above, the Center continued previous activities designed to obtain input from stakeholders. Formal opportunities to obtain feedback occur during meetings of our Center for Agriculture Advisory Board and when UMass Extension convenes the Extension Board of Public Overseers. While these interactions included organizational updates, they are designed largely as opportunities for listening to our stakeholders who provide feedback on budgets, activities, outcomes and goals, and future directions. Significant input is also routinely collected at the level of individual projects and specific programs. These include formal opportunities for collecting feedback on specific programs through focus groups, interviews, stakeholder meetings, written or web-based surveys as well as many informal opportunities that transpire during the course of regular meetings, conferences events and presentations.

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.

3. A statement of how the input will be considered

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

Brief explanation.

The activities and methods used for obtaining input from stakeholders described above were components in a larger strategic planning and reorganization process for the Center for Agriculture that was designed to help us identify organizational priorities and structure the Center in ways that better serve constituents while effectively integrating research and applied research with public education, outreach and extension. Information obtained from the survey was disseminated broadly and served as the starting point for subsequent discussion with a variety of external stakeholder

groups and internal staff. Survey results as well as insights gained from subsequent discussions with external stakeholder groups were combined with the significant content generated by professional staff and faculty during planning activities and a working group was appointed to review the content and develop specific recommendations. Center administrators were charged with synthesizing the materials generated during this process and created a set of strategic principles and organizational values that served as foundational elements in a strategic plan for reorganizing the Center for Agriculture. A copy of the plan is available at: http://extension.umass.edu/email-campaigns/Reorganization-Plan-CfA.pdf

Brief Explanation of what you learned from your Stakeholders

A selection of questions and results from our stakeholder survey follows:

1) Aside from nationally recognized research and access to affordable student education, what do you think MA citizens expect from a high-quality state university? (top 3 responses)

- tools and technologies
- expert advice and consultation
- diagnostic services

2) How can UMass Amherst best contribute to agriculture and food systems in Massachusetts? (top 3 responses)

- conduct scientific investigations of agriculture and food systems
- support sound environmental practices for Massachusetts agriculture
- inform policy and legislation related to agriculture & food systems

3) How can UMass Amherst best contribute to environmental stewardship in Massachusetts? (top 3 responses)

- conduct environmental science research
- educate state or local officials, boards and environmental decision-makers
- develop environmental assessment tools and technologies

4) How can UMass Amherst best contribute to the positive development of youth in Massachusetts? (top 3 responses)

- Enrich science, technology, engineering and math education
- Involve youth in local agriculture and food systems
- Involve youth in environmental stewardship programs

5) How can UMass Amherst best contribute to the nutritional health and physical well-being of Massachusetts residents? (top 3 responses)

- Conduct scientific investigations of nutritional health & physical well-being
- Support farm to school programs
- Inform Massachusetts health policy, regulation and legislation

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2491085	0	2486620	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	2765823	0	2126410	0
Actual Matching	2567185	0	3148426	0
Actual All Other	5115238	0	7111969	0
Total Actual Expended	10448246	0	12386805	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	198638	0	0	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
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	Massachusetts Center for Agriculture Administration

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	11%		3%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		5%	
204	Plant Product Quality and Utility (Preharvest)	11%		0%	
205	Plant Management Systems	10%		2%	
206	Basic Plant Biology	0%		6%	
211	Insects, Mites, and Other Arthropods Affecting Plants	13%		11%	
212	Pathogens and Nematodes Affecting Plants	13%		15%	
216	Integrated Pest Management Systems	23%		1%	
301	Reproductive Performance of Animals	0%		9%	
303	Genetic Improvement of Animals	0%		8%	
304	Animal Genome	0%		3%	
307	Animal Management Systems	7%		0%	
311	Animal Diseases	0%		18%	
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	0%		3%	
604	Marketing and Distribution Practices	12%		2%	
701	Nutrient Composition of Food	0%		2%	
703	Nutrition Education and Behavior	0%		2%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%		9%	
801	Individual and Family Resource Management	0%		1%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	13.7	0.0	11.2	0.0
Actual Paid Professional	13.0	0.0	12.6	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
245205	0	1067164	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
560960	0	1190876	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
563620	0	3693888	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

2. Brief description of the target audience

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

3. How was eXtension used?

Staff contributed to eXtension Apples - Community of Practice (CoP)

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	30575	33014	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	39

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Demonstrations

Year	Actual
2013	68

Output #2

Output Measure

- Diagnostic Services

Year	Actual
2013	5142

Output #3

Output Measure

- Facilitated Group Meetings and Conferences

Year	Actual
2013	15

Output #4

Output Measure

- Individual Consultations and Site Visits

Year	Actual
2013	1332

Output #5

Output Measure

- Printed Materials

Year	Actual
2013	54

Output #6

Output Measure

- Single day workshop, presentation or event

Year	Actual
2013	80

Output #7

Output Measure

- Websites or other computer-based delivery

Year	Actual
2013	111

Output #8

Output Measure

- Workshop series or educational course

Year	Actual
2013	5

Output #9

Output Measure

- Peer review publications

Year	Actual
2013	39

Output #10

Output Measure

- Applied Research Projects
  Not reporting on this Output for this Annual Report

Output #11

Output Measure

- Basic and Applied Research Projects

Year	Actual
2013	30

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Participants acquire knowledge and skills for practices that ensure economically viable food production.
2	Participants adopt practices that ensure economically viable food production
3	Participants acquire knowledge and skills for practices that ensure the environmentally sustainable food production
4	Participants adopt practices that ensure environmentally sustainable food production
5	Participants acquire knowledge and skills to develop and market locally grown or raised food products more effectively
6	Participants develop and market locally grown or raised food products more effectively
7	Creation and synthesis of knowledge related to Global Food Security and Hunger
8	Participants acquire the knowledge and skills to implement pest management practices that minimize the impact on human health

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	3132

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The crops, dairy, livestock, and equine industries are important economic contributors to the Massachusetts economy. The dairy and livestock farmers in Massachusetts manage more than 130,000 acres of hay, pasture and corn, contributing to open space that is important to both non-farm residents and tourism. UMass Extension conducts applied research and provides educational opportunities and technical assistance that enhances the economic viability of dairy operations and livestock producers.

What has been done
We promoted the use of cover crops to improve soil health, reduce fertilizer purchase, and reduce soil erosion. Research and on-farm demonstrations were implemented that focused on: a) using tillage radish to suppress weeds; b) Determining the optimum time of planting of winter rye for maximum nutrient recovery; c) Using cover crops to minimize use of herbicide and d) Determining the optimum sowing rate of hairy vetch cover crop and assessment of its nitrogen contribution to corn silage.

Results
We successfully promoted tillage radish as a new cover crop to Massachusetts growers. The cover crop was so successful that many farmers from dairy operations to vegetable growers have already started growing it. Dairy farmers are more interested to extend their grazing season while vegetable growers are using the radish to reduce compaction, controlling weeds, and adding organic carbon to the soil.

4. Associated Knowledge Areas

KA Code	Knowledge Area

102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

Participants adopt practices that ensure economically viable food production

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	890

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Cranberry growing has a rich history and considerable value in Massachusetts. As growers face increasing competition from within the United States and internationally, the focus to remain economically competitive and environmentally sustainable has sharpened. Growers must develop and adopt innovative technology and practices for the industry to remain a viable and productive.

What has been done
We have been working with a group of cranberry growers to demonstrate the positive environmental impact of reducing applications of phosphorus (P) fertilizer.

Results
Growers have reduced P rates from 15-30 lb/a to <10 lb/a with no reduction in yield. At the sites where P concentration in harvest water was greatest prior to P fertilizer reduction, P concentration in harvest water declined by 50-87% after 4 to 7 years of P fertilizer reduction. At the longest established reduction site, P load in harvest discharge declined by more than 85%. In 2012-2013, additional sites were added to this study and many other growers (as many as 65% in a 435 grower survey -- 165 responding) report that they have reduced their P use after hearing the outcomes achieved by the grower participant group.

4. Associated Knowledge Areas

KA Code	Knowledge Area

102	Soil, Plant, Water, Nutrient Relationships
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
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

Outcome #3

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	7908

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Management of nutrients sources within the constraints of the production system is fundamental for maintaining environmental quality. Poor management of plant nutrients can lead to economic losses and environmental degradation of soil, air, and water quality. The UMass Extension Soil and Plant Tissue Testing Laboratory offers accurate and affordable analytical testing of soil, plant tissue, compost, and non-soil greenhouse media. These services help clients manage soil and soil amendments more profitably while protecting environmental quality.

What has been done
In 2013, the University of Massachusetts Soil and Plant Tissue Testing Laboratory provided analytical results, interpretation, and recommendations for over 20,000 soil samples. We also tested over 271 compost samples and 1,500 plant tissue samples. Lab staff provided soil fertility and nutrient management guidance to approximately 1,500 landscapers, extension personnel, crop consultants, farmers, and gardeners through telephone, e-mail, and in person consultations.

Results

Participants acquired knowledge and skills for implementing more environmentally sound and sustainable practices for soil fertility and nutrient management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
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

Outcome #4

1. Outcome Measures

Participants adopt practices that ensure environmentally sustainable food production

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	3194

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Vegetable farming in Massachusetts has remained vital in recent decades through constant and creative change: more direct marketing, diversification, selection of high value crops, and adoption of new technologies. The twenty thousand Massachusetts acres used to produce vegetables (worth over $80 million in farm-gate value and over $240 million retail value) are a resource for food, open space, environmental quality, economic vitality, and quality of life in the Commonwealth.

What has been done
Thirteen mentor farms set goals for improved management of crops and pests. Mentor Farms also received free disease diagnostics, free soil and tissue testing, and traps for monitoring particular pests. Eight partner farms conducted a targeted research or demonstration project on a pest management issue relevant to their farm needs. All farms received specific

recommendations for managing pests in ways that are consistent with the principles and practices of Integrated Pest Management.

Results
Throughout the growing season, detailed timelines were kept for each mentor farm that chronicled the observations and the recommended actions made for managing pests. Recommendations were consistent with the principles and practices of Integrated Pest Management. Data was obtained from 10 farms where a total of 310 recommended actions were documented. Of the 310 recommended actions: 51% were taken/followed as recommended; 28% were taken/followed with some modification; 21% were not taken/followed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
204	Plant Product Quality and Utility (Preharvest)
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
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

Outcome #5

1. Outcome Measures

Participants acquire knowledge and skills to develop and market locally grown or raised food products more effectively

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Participants develop and market locally grown or raised food products more effectively

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	4411

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
216	Integrated Pest Management Systems
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

V(H). Planned Program (External Factors)

External factors which affected 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.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Vegetable Project: Throughout the growing season, detailed timelines were kept for each mentor farm that chronicled the observations and the recommended actions made at each farm. These timelines were used to generate an evaluation template in which the outcome of recommended actions (e.g. cultural control, biocontrol, spray program improvement, scouting, etc.) was assessed during extensive post-season interviews with mentor growers. Data was obtained from 10 farms where a total of 310 recommended actions were documented. Of the 310 recommended actions:

- 51% were taken/followed as recommended
- 28% were taken/followed with some modification
- 21% were not taken/followed

Over all actions that were taken/followed as recommended, growers rated 60% of them 'very successful', and 29% 'moderately successful'.

Cranberry Project: We have been working with a group of cranberry growers to demonstrate the positive environmental impact of reducing applications of phosphorus (P) fertilizer. These growers have reduced P rates from 15-30 lb/a to <10 lb/a with no reduction in yield. At the 3 sites where P concentration in harvest water was greatest prior to P fertilizer reduction, P concentration in harvest water declined by 50-87% after 4 to 7 years of P fertilizer reduction. At the longest established reduction site, P load in harvest discharge declined by more than 85%. In 2012-2013, an additional 5 sites were added to this study and many other growers (as many as 65% in a 435 grower survey -- 165 responding) report that they have reduced their P use after hearing the outcomes achieved by the grower participant group.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Climate Change

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water	10%		0%	
112	Watershed Protection and Management	50%		0%	
131	Alternative Uses of Land	0%		8%	
132	Weather and Climate	30%		0%	
133	Pollution Prevention and Mitigation	10%		0%	
136	Conservation of Biological Diversity	0%		7%	
206	Basic Plant Biology	0%		42%	
213	Weeds Affecting Plants	0%		43%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.6	0.0	0.7	0.0
Actual Paid Professional	0.9	0.0	0.9	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
1136	0	18852	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
57548	0	108123	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	148525	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

2. Brief description of the target audience

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

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	30	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Applied Research Projects
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Facilitated Group Meetings and Conferences
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Printed Materials
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Single day workshop, presentation or event
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Websites or Other Computer-based Delivery
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Peer review publications

Year	Actual
2013	2

Output #7

Output Measure

- Workshop series or educational course

Year	Actual
2013	1

Output #8

Output Measure

- Basic and Applied Research Projects

Year	Actual
2013	5

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Participants acquire knowledge and skill to reduce or mitigate the effects or risks associated with future changes in climate or weather
2	Participants implement practices to reduce or mitigate the effects or risks associated with future changes in climate or weather
3	Creation and synthesis of knowledge related to future changes in climate or weather

Outcome #1

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

No results to report. Assessments in progress

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Sustainable Energy

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
131	Alternative Uses of Land	0%		6%	
202	Plant Genetic Resources	0%		50%	
402	Engineering Systems and Equipment	30%		14%	
504	Home and Commercial Food Service	0%		9%	
511	New and Improved Non-Food Products and Processes	30%		13%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	40%		0%	
902	Administration of Projects and Programs	0%		4%	
903	Communication, Education, and Information Delivery	0%		4%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.6	0.0	2.3	0.0
Actual Paid Professional	0.8	0.0	1.5	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
1214	0	199131	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
51441	0	163261	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	605492	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Applied Research
Facilitated Group Meetings and Conferences
Printed Materials
Single day workshop, presentation or event

2. Brief description of the target audience

Growers, agricultural businesses, real estate developers, building managers, municipalities, public utilities, homeowners

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1115	45	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Applied Research Projects
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Facilitated Group Meetings and Conferences
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Printed Materials
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Single day workshop, presentation or event

Year	Actual
2013	3

Output #5

Output Measure

- Websites or Other Computer-based Delivery
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Peer review publications

Year	Actual

2013	1

Output #7

Output Measure

- Analytic Tools and Techniques

Year	Actual
2013	2

Output #8

Output Measure

- Demonstrations

Year	Actual
2013	2

Output #9

Output Measure

- Diagnostic Services

Year	Actual
2013	5

Output #10

Output Measure

- Individual Consultations and Site Visits

Year	Actual
2013	100

Output #11

Output Measure

- Published Article (News, Professional, Trade)

Year	Actual
2013	9

Output #12

Output Measure

- Workshop series or educational course

Year	Actual
2013	7

Output #13

Output Measure

- Basic and Applied Research Projects

Year	Actual
2013	8

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Participants acquire knowledge and skill for energy conservation or efficiency practices for the built environment
2	Participants implement energy conservation or efficiency practices for the built environment
3	Creation and synthesis of knowledge related to environmentally sustainable energy resources
4	Participants acquire knowledge and skill for energy conservation or efficiency practices for agricultural businesses
5	Participants implement energy conservation or efficiency practices for agricultural businesses
6	Target audiences increase knowledge and skill for utilizing renewable energy sources
7	Target audiences increase use of renewable energy sources

Outcome #1

1. Outcome Measures

Participants acquire knowledge and skill for energy conservation or efficiency practices for the built environment

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	500

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Citizens, policy makers and businesses share an interest in policies and practices that reduce fuel consumption, enhance conservation practices and limit the cost dedicated to renewable and non-renewable sources of energy. UMass Extension engages in applied research, teaching and outreach to inform practitioners and consumers about building science and energy efficiency strategies and practices.

What has been done
As part of a continuing relationship with Western Massachusetts Electric Company we identified large potential savings and facilitated the implementation of energy savings measures at the utility's largest customers. The largest customer is the University of Massachusetts and in Fall 2012 we recruited students to do a sweep of the entire campus and worked with physical plant officials to place an order for 3.1K LED bulbs. These bulbs are now installed saving 213.8 MWh/yr or about $21K/yr.

Results
Target audiences learned building and design practices that increase energy efficiency and increased the use of renewable energy sources

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

Outcome #2

1. Outcome Measures

Participants implement energy conservation or efficiency practices for the built environment

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	175

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

Outcome #3

1. Outcome Measures

Creation and synthesis of knowledge related to environmentally sustainable energy resources

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Participants acquire knowledge and skill for energy conservation or efficiency practices for agricultural businesses

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment

Outcome #5

1. Outcome Measures

Participants implement energy conservation or efficiency practices for agricultural businesses

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment

Outcome #6

1. Outcome Measures

Target audiences increase knowledge and skill for utilizing renewable energy sources

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	300

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

Outcome #7

1. Outcome Measures

Target audiences increase use of renewable energy sources

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	175

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Public Policy changes
- Government Regulations

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

No results to report. Assessments in progress

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Food Safety

☑ Reporting on this Program

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%		8%	
501	New and Improved Food Processing Technologies	20%		19%	
502	New and Improved Food Products	0%		3%	
511	New and Improved Non-Food Products and Processes	0%		12%	
609	Economic Theory and Methods	0%		1%	
701	Nutrient Composition of Food	0%		1%	
702	Requirements and Function of Nutrients and Other Food Components	0%		1%	
703	Nutrition Education and Behavior	0%		5%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	20%		6%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	60%		21%	
723	Hazards to Human Health and Safety	0%		12%	
724	Healthy Lifestyle	0%		11%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	1.1	0.0	2.2	0.0
Actual Paid Professional	1.1	0.0	6.2	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
87237	0	245633	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
125561	0	640357	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	309655	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

2. Brief description of the target 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

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	128	75	1010	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year:	2013
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	12

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Workshop series or educational course

Year	Actual
2013	1

Output #2

Output Measure

- Displays and Exhibits
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Websites or Other Computer-based delivery
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Peer review publications

Year	Actual
2013	12

Output #5

Output Measure

- Demonstrations

Year	Actual
2013	4

Output #6

Output Measure

- Individual Consultations and Site Visits

Year	Actual
2013	18

Output #7

Output Measure

- Published Article (News, Professional, Trade)

Year	Actual
2013	1

Output #8

Output Measure

- Single day workshop, presentation or event

Year	Actual
2013	2

Output #9

Output Measure

- Basic and Applied Research Projects

Year	Actual
2013	19

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Participants acquire knowledge and skill for practices to avoid food borne illness
2	Participants implement practices to avoid food borne illness
3	Participants acquire knowledge and skill for practices to control food safety risks and hazards
4	Participants adopt practices to control food safety risks and hazards
5	Creation and synthesis of knowledge related to the safety of food

Outcome #1

1. Outcome Measures

Participants acquire knowledge and skill for practices to avoid food borne illness

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Water management is an important control to monitor for postharvest processing produce. While Good Agricultural Practices provides guidance for quality management throughout the farming process, there is an opportunity to provide better outlined process controls to facilitate farmer?s management practices. Specifically, postharvest sanitation is a critical step that has shown to reduce microbial loads, thereby reducing pathogenic risks.

What has been done
The initial phase of this effort has been oriented towards the laboratory to research and validate currently available quality control tools that are available. In addition, research has been conducted in the development of a lateral flow assay that could potential help to evaluate the quality of water for on-farm use.

Results
Researchers developed mechanisms and resources to help growers use tools and techniques for managing postharvest rinse water.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
723	Hazards to Human Health and Safety

Outcome #2

1. Outcome Measures

Participants implement practices to avoid food borne illness

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Participants acquire knowledge and skill for practices to control food safety risks and hazards

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	291

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
723	Hazards to Human Health and Safety

Outcome #4

1. Outcome Measures

Participants adopt practices to control food safety risks and hazards

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	213

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Outcome #5

1. Outcome Measures

Creation and synthesis of knowledge related to the safety of food

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

From EFNEP Project: Six hundred fifty-seven EFNEP participants showed improvement in one or more safe food handling practices related to storing meat and dairy foods and thawing frozen foods (data from EFNEP Behavior Checklist Summary Report)

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Childhood Obesity

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
502	New and Improved Food Products	0%		13%	
703	Nutrition Education and Behavior	50%		43%	
704	Nutrition and Hunger in the Population	15%		32%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%		0%	
724	Healthy Lifestyle	25%		12%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	38.9	0.0	0.8	0.0
Actual Paid Professional	31.2	0.0	1.3	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
575	0	146172	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
182115	0	170958	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
2388993	0	21965	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

2. Brief description of the target 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

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	17656	72475	27362	5851

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	7

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Demonstrations

Year	Actual
2013	119

Output #2

Output Measure

- Displays and Exhibits

Year	Actual
2013	108

Output #3

Output Measure

- Printed Materials

Year	Actual
2013	1

Output #4

Output Measure

- Single day workshop, presentation or event

Year	Actual
2013	221

Output #5

Output Measure

- Workshop series or educational course

Year	Actual
2013	1611

Output #6

Output Measure

- Peer review publications

Year	Actual
2013	7

Output #7

Output Measure

- Basic and Applied Research Project

Year	Actual
2013	6

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Participants gain knowledge and skill to improve physical activity behaviors
2	Participants improve physical activity behaviors
3	Participants gain knowledge and skill to improve dietary behaviors
4	Participants improve dietary behaviors
5	Creation and synthesis of knowledge related to childhood obesity
6	Participants improve food resource management behaviors

Outcome #1

1. Outcome Measures

Participants gain knowledge and skill to improve physical activity behaviors

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Participants improve physical activity behaviors

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	301

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #3

1. Outcome Measures

Participants gain knowledge and skill to improve dietary behaviors

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	64

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
724	Healthy Lifestyle

Outcome #4

1. Outcome Measures

Participants improve dietary behaviors

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	5087

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Childhood obesity is a national epidemic. In Massachusetts, the medical cost for obesity has been estimated at well over one billion dollars 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. Many of the chronic health problems associated with obesity are largely preventable.

What has been done
Extension provides nutrition education to eligible SNAP participants to establish healthy eating habits and physically active lifestyles. In FY 2013, Staff reached 30,362 adult and youth participants with direct education. A total of 124,718 individuals were reached through indirect nutrition education methods (displays, farmers' market food demonstrations, leave-behind enrichment activities for school staff to use with children, newsletters, blog, and telephone Tip Line).

Results
Adult participants used a grocery list while shopping more often. Participating youth (grades 3-8) became more physically active and ate fruits and vegetables more often. Participating youth (grades 6-8) drank sweetened drinks less often and choose to eat whole grains foods more often. Participating youth (grades 6-8) consumed nonfat or low-fat milk and milk products more often.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

Outcome #5

1. **Outcome Measures**

Creation and synthesis of knowledge related to childhood obesity

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

Participants improve food resource management behaviors

2. **Associated Institution Types**

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	890

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Rates of obesity and poor nutrition continue to increase for both adults and children in the United States. This is especially prevalent among low-income populations, as parents frequently turn to calorie-dense, but low-nutrient foods when family food resources are limited. Eating habits that are formed during childhood are critically important as they lay the groundwork for future patterns that can affect lifelong health. Families need guidance to get the most nutrition from their limited resources in order for their children to grow and thrive.

What has been done
Extension staff fulfilled EFNEP's mission is to assist limited-resource families to acquire the knowledge, skills, attitudes, and changed behaviors necessary for nutritionally sound diets, and to contribute to their personal development and the improvement of the total family diet and nutritional well-being. Professional staff provided supervision and leadership for EFNEP, while 21 paraprofessionals (11.09 FTE) provided nutrition education to low-income adults and youth. A total of 1,764 adults and 1,955 youth were reached in FY 2013.

Results
EFNEP participants demonstrated positive changes in dietary intake and also showed improvement in food resource management practices related to planning meals that included

comparing prices, not running out of food, and using a grocery shopping list.

4. Associated Knowledge Areas

KA Code	Knowledge Area
704	Nutrition and Hunger in the Population
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
724	Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

From SNAP-Ed Project:

- Pre- and post-surveys showed that 811 youth in grades 3-8 who participated in a series of SNAP-Ed workshops were physically active more often.
- Pre- and post-surveys showed that 767 youth in grades 3-8 who participated in a series of SNAP-Ed workshops ate fruits more often
- Pre- and post-surveys showed that 822 youth in grades 3-8 who participated in a series of SNAP-Ed workshops ate vegetables more often
- Pre- and post-surveys showed that 193 youth in grades 3-8 who participated in a series of SNAP-Ed workshops drink sweetened drinks less often

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Economic Development

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	8%		0%	
111	Conservation and Efficient Use of Water	0%		8%	
133	Pollution Prevention and Mitigation	22%		0%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		14%	
205	Plant Management Systems	22%		0%	
211	Insects, Mites, and Other Arthropods Affecting Plants	11%		14%	
212	Pathogens and Nematodes Affecting Plants	11%		3%	
216	Integrated Pest Management Systems	3%		0%	
304	Animal Genome	0%		5%	
311	Animal Diseases	0%		22%	
511	New and Improved Non-Food Products and Processes	0%		23%	
601	Economics of Agricultural Production and Farm Management	0%		4%	
602	Business Management, Finance, and Taxation	20%		0%	
605	Natural Resource and Environmental Economics	0%		2%	
723	Hazards to Human Health and Safety	3%		0%	
801	Individual and Family Resource Management	0%		3%	
802	Human Development and Family Well-Being	0%		2%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Extension	Research

Year: 2013	1862	1890	1862	1890
Plan	14.6	0.0	2.4	0.0
Actual Paid Professional	10.3	0.0	3.6	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
549800	0	219619	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
351387	0	450976	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
437508	0	830290	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

2. Brief description of the target audience

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

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	9909	244538	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	7

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Demonstrations

Year	Actual
2013	4

Output #2

Output Measure

- Displays and Exhibits

Year	Actual
2013	1

Output #3

Output Measure

- Facilitated Group Meetings and Conferences

Year	Actual
2013	44

Output #4

Output Measure

- Individual Consultations and Site Visits

Year	Actual
2013	1712

Output #5

Output Measure

- Printed Materials

Year	Actual
2013	9

Output #6

Output Measure

- Published Articles (New, Professional and Trade)
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Single day workshop, presentation or event

Year	Actual
2013	8

Output #8

Output Measure

- Websites or other computer-based delivery

Year	Actual
2013	49

Output #9

Output Measure

- Workshop series or educational course

Year	Actual
2013	8

Output #10

Output Measure

- Applied Research Projects
  Not reporting on this Output for this Annual Report

Output #11

Output Measure

- Diagnostic Services
  Not reporting on this Output for this Annual Report

Output #12

Output Measure

- Academic Presentation/Poster
  Not reporting on this Output for this Annual Report

Output #13

Output Measure

- Peer review publications

Year	Actual
2013	7

Output #14

Output Measure

- Research, grant or policy report
  Not reporting on this Output for this Annual Report

Output #15

Output Measure

- Professional or trade presentation/poster

Year	Actual
2013	20

Output #16

Output Measure

- Basic and Applied Research Projects

Year	Actual
2013	14

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Participants acquire knowledge and skills that enhance the environmental sustainability of agricultural businesses.
2	Participants adopt practices that enhance the environmental sustainability of agricultural businesses.
3	Participants acquire knowledge and skills that enhance the economic viability of agricultural businesses
4	Participants adopt practices that enhance the economic viability of agricultural businesses
5	Creation and synthesis of knowledge related to the environmentally sustainable and economic viabilty agricultural businesses
6	Participants acquire the knowledge and skill to reduce the risk of exotic pests, diseases and invasive species
7	Participants adopt practices that reduce the risk of exotic pests, diseases and invasive species

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1362

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Pesticides are vital tools for controlling pests and maintaining an adequate food supply. If used improperly, pesticides can also threaten human health and the natural environment. Inexperienced applicators, accidents, inadequate protection and equipment continue to be areas of concern that increase the potential for negative personal and environmental impacts from pesticide exposure.

What has been done
Approximately 3300 pesticide exam study manuals were distributed to approximately 2000 individuals preparing for the state administered pesticide applicator license exams. The Pesticide Education program conducted twenty-four two-day workshops to help individuals prepared for the Massachusetts state pesticide license exams. The Program also offered 20 pesticide recertification training workshops to 1,815 individuals that already have pesticide licenses and certifications.

Results
Individuals who took the workshop continue to pass the Massachusetts pesticide certification exam at a higher rate than those who did not take the workshop. Fifty-nine percent of the individuals who took the workshop passed the exam compared to a passing rate of 50% for nonparticipants; a 16.5% percentage difference in the passing rate between the two groups. Participants were given an opportunity to evaluate the workshops. Of the 1362 individuals who completed evaluations, 60% indicated that they increased their knowledge, "very much" and 55% indicated that they would "very much" use the information/techniques that they learned.

4. Associated Knowledge Areas

KA Code	Knowledge Area

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

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	223

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Diversified farms are adding greenhouse crops to their businesses strategies. Plant production is also the basis for associated horticultural industries, plant and seed propagators, product suppliers and other service providers. These stakeholders have significant economic and environmental impacts for Massachusetts and requires solutions to problems of energy, pest management, trained labor, water quality, production practices and plant nutrition for a diverse range of crops and complex agricultural and environmental issues.

What has been done
Activities included grower consultations; educational workshops and conferences (twilight meeting on Impatiens Downy Mildew, Attracting and Conserving Natural Enemies, Northeast Greenhouse Conference, Day-long Winter Grower Educational Program, Employee Training for Garden Retailers, Summer Field Day); articles publications and newsletters, maintaining up-to-date information on websites.

Results
Growers learned to identify attract and manage beneficial, natural enemies. Growers learned about Impatiens Downy Mildew and used that information to make business decisions. Growers learned to use biological control and organic production methods.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
205	Plant Management Systems

216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #4

1. Outcome Measures

Participants adopt practices that enhance the economic viability of agricultural businesses

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	700

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

Outcome #7

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	97

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

From Sustainable Greenhouse Management Project: Evaluations conducted with attendees of the Northeast Greenhouse Conference showed: 40 growers intend to use information on biological control, 20 growers intend to use information on controlling pests in retail greenhouses, 30 growers intend to use information about growing greenhouse vegetables, 40 intend to use information on organic production, 30 intend to use information on proper use of plant growth regulators, and 50 intend to use information on plant nutrition.

From Pesticide Education Project: State Pesticide Certification exam results provided by the Massachusetts Department of Agricultural Resources showed the following: Individuals who participated in UMass Extension training continue to pass at a higher rate than those who did not take the workshop. Fifty-nine percent of the individuals who took the workshop passed the exam compared to a passing rate of 50% for nonparticipants. This represents a 16.5% percentage difference in the passing rate between the two groups.

A total of 1,815 individuals participated in recertification workshops. Of the 1362 individuals who completed evaluations, 60% indicated that they increased their knowledge, "very much" and 55% indicated that they would "very much" use the information/techniques that they learned.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Youth Development

☑ Reporting on this Program

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 (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	14.1	0.0	0.0	0.0
Actual Paid Professional	12.2	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
757759	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
368240	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
816671	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

4-H Clubs
Community Service Project
Curricula/Instructional materials
Facilitated Group Meetings and Conferences
Printed Materials
Single day workshop, presentation or event
Websites or Other Computer-based Delivery
Workshop series or educational course

2. Brief description of the target 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

3. How was eXtension used?

{No Data Entered}

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	5699	28545	19527	11375

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- 4-H Clubs

Year	Actual
2013	3122

Output #2

Output Measure

- Community Service Projects

Year	Actual
2013	33

Output #3

Output Measure

- Curricula/Instructional Materials

Year	Actual
2013	4

Output #4

Output Measure

- Facilitated Group Meetings and Conferences

Year	Actual
2013	151

Output #5

Output Measure

- Printed Materials

Year	Actual
2013	164

Output #6

Output Measure

- Single day workshop, presentation or event

Year	Actual
2013	77

Output #7

Output Measure

- Websites or other computer-based delivery

Year	Actual
2013	1

Output #8

Output Measure

- Workshop series or educational course

Year	Actual
2013	423

Output #9

Output Measure

- Displays and Exhibits

Year	Actual
2013	161

Output #10

Output Measure

- Individual Consultations and Site Visits

Year	Actual
2013	197

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Youth acquire skills that will help them succeed academically and in the workplace
2	Youth demonstrate skills that will help them succeed academically and in the workplace
3	Youth are effective team members, communicators, and leaders
4	Youth increase knowledge and skill and interest in science, engineering and technology
5	Military youth feel supported
6	Adults acquire knowledge of the effects of deployment on military youth
7	Youth engage in community service
8	Youth acquire citizenship skills

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	50

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Young people are the future workforce and leaders of our state and our nation. The healthy development of these youth cannot be left to chance. Since 1919, the Massachusetts 4-H Program has provided support, resources and educational opportunities to Massachusetts youth. The mission of Massachusetts 4-H is to prepare youth to become independent and contributing members of society by providing them with the tools they need to be successful.

What has been done
3,000 youth participated in more than 300 4H clubs across the state. About 200 youth participated in trainings focused on identifying and reducing risks involved in working with animals. Poultry Workshops were added and a renewed interest in the beef project allowed us to form a 4-H Beef Advisory Committee of interested volunteers. We met our goal of increasing membership in the 4-H club program by 3% over the previous year. Our focus on the Visual Presentations continues where youth learn to develop and deliver a public presentation.

Results
Parents and youth indicated that programs made youth better public speakers and taught them how to set goals and work to achieve them. Youth also indicated the program helped them to get better grades in school.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	616

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Youth are effective team members, communicators, and leaders

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	3633

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #4

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1358

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #5

1. Outcome Measures

Military youth feel supported

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	268

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
When children experience the deployment and reintegration of a family member,they must cope with new daily stresses and responsibilities. In Massachusetts, many Reserve and National Guard personnel do not live on or near military bases but instead are scattered throughout communities across the state and do not have access to the same support and resources that are often associated with living in a more concentrated military community.

What has been done
More than 2,000 youth participated in Military Kids Klub days, ropes courses, rock wall climbing lessons leadership trainings family events and pre and post deployment seminars. Eight ?Ready, Set, Go!? workshops reached 256 community members providing education on military culture, the deployment cycle, its effects on children and what resources are available to help military children. 42 additional briefings and 25 planning meetings reached 3006 people with the message of supporting military children.

Results
Adults report that OMK informational sessions increased their knowledge of the effects of deployment on military youth. Activities and recognition (Mobile Tech Lab, Hero Packs) helped youth to feel more supported by the community and more connected to deployed family members. In addition we received donations totaling over $54,000 and 412 community volunteers donated 1611 hours of service to assist children of Massachusetts military families.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

Outcome #6

1. Outcome Measures

Adults acquire knowledge of the effects of deployment on military youth

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	222

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

Outcome #7

1. Outcome Measures

Youth engage in community service

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	2553

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
UMass Extension partners with Massachusetts high schools and community organizations to help young people to grow into caring, capable, scientifically literate, well-informed, engaged citizens who are prepared to contribute to their communities in the 21st century. The Envirothon collaboration develops well-designed challenges for youth teams and provides adult coaches with background information and community connections that will help them be effective in their work with youth on community issues.

What has been done
Envirothon teams representing prepare through the year for a statewide event in May that tests their knowledge of forest, wildlife, water, and soil resources, and current environmental issues. The program stresses the interdependence of human and natural systems and emphasizes hands-on, team-oriented problem solving and community involvement. Throughout the school year, we provide resource materials for use in the classroom, workshops geared to both teachers and students, and opportunities to encounter environmental professionals in action.

Results
About 84% of team members reported a moderate or great increase in their interest in ?taking action for the environment in your community?. All responding coaches saw a moderate to great increase in their teams? ?engagement with their community?. 13 out of 28 competing teams engaged in an action project to the point of meeting the requirements to qualify for the Mass Envirothon Community Action Award. The number of Envirothon youth participating in service projects jumped by more than half from last year, from 67 to 106.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #8

1. **Outcome Measures**

Youth acquire citizenship skills

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected 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.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

From Massachusetts Envirothon Project :

Knowledge of Ecosystems and Natural Resources - 87% of team members reported that their "familiarity with outdoor places and ecosystems in their communities" had increased by a moderate or great extent.

Knowledge of Tree and Forest Sustainability - 88% of team members reported that their Envirothon experience had increased their knowledge of trees, forests, and sustainability to a moderate or great extent. Fully 100% of coaches saw an increase "to a moderate or great extent" in their teams' knowledge of tree and forest sustainability issues.

Teamwork and Presentation Skills. 82% of team members believed that their Envirothon preparation had increased their ability to work with others as a team to a moderate or great extent.

Navigating Community Issues - 78% of all team members felt that their "understanding of how decisions about the environment and natural resources are made in your community" had increased to a moderate or great extent. 70% reported an increase to a moderate or great extent in their "ability to find and talk to people with knowledge about the environment".

Community Service - about 84% of team members reported a moderate or great increase in their interest in "taking action for the environment in your community".

Environmental Stewardship - 74% of participating youth reported that their interest

in reducing their environmental impact (ecological footprint) had increased to a moderate or great extent as a result of their Envirothon participation.

Spending Time Outdoors - 80% of team members reported that their Envirothon involvement had increased their interest in spending time outdoors. Those who had felt an increase noted it emphatically, with 58% rating it as increasing to a great extent. Only teamwork skills were ranked as high as a learning outcome.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Environmental Stewardship

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	15%		2%	
111	Conservation and Efficient Use of Water	0%		4%	
112	Watershed Protection and Management	5%		19%	
123	Management and Sustainability of Forest Resources	19%		0%	
124	Urban Forestry	0%		2%	
131	Alternative Uses of Land	2%		0%	
133	Pollution Prevention and Mitigation	2%		21%	
135	Aquatic and Terrestrial Wildlife	5%		13%	
136	Conservation of Biological Diversity	10%		0%	
211	Insects, Mites, and Other Arthropods Affecting Plants	10%		26%	
212	Pathogens and Nematodes Affecting Plants	10%		0%	
216	Integrated Pest Management Systems	2%		0%	
307	Animal Management Systems	0%		5%	
605	Natural Resource and Environmental Economics	0%		5%	
608	Community Resource Planning and Development	15%		0%	
609	Economic Theory and Methods	0%		3%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	5%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890

Plan	17.7	0.0	3.0	0.0
Actual Paid Professional	12.4	0.0	3.2	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
282768	0	229839	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
484587	0	423875	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
598149	0	1502154	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Analytic Tools and Techniques
Basic and Applied Research
Diagnostic Services
Displays and Exhibits
Facilitated Group Meetings and Conferences
Printed Materials
Published Article (Academic)
Published Article (news, professional, trade)
Research, Grant, or Policy Report
Single day workshop, presentation or event
Survey or needs assessment
Websites or Other Computer-based Delivery
Workshop series or educational course

2. Brief description of the target audience

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

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	87907	264077	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Analytic Tools and Techniques

Year	Actual
2013	6

Output #2

Output Measure

- Diagnostic Services

Year	Actual
2013	1251

Output #3

Output Measure

- Facilitated Group Meetings and Conferences

Year	Actual
2013	33

Output #4

Output Measure

- Printed Materials

Year	Actual
2013	78

Output #5

Output Measure

- Published Articles (News, Professional and Trade)

Year	Actual
2013	29

Output #6

Output Measure

- Single day workshop, presentation or event

Year	Actual
2013	173

Output #7

Output Measure

- Survey or needs assessment

Year	Actual
2013	17

Output #8

Output Measure

- Websites or other computer-based delivery

Year	Actual
2013	334

Output #9

Output Measure

- Workshop series or educational course

Year	Actual
2013	9

Output #10

Output Measure

- Applied Research Projects
  Not reporting on this Output for this Annual Report

Output #11

Output Measure

- Displays and Exhibits
  Not reporting on this Output for this Annual Report

Output #12

Output Measure

- Peer review publications

Year	Actual
2013	3

Output #13

Output Measure

- Research, Grant or Policy Report

Year	Actual
2013	11

Output #14

Output Measure

- Book or Book Chapter
  Not reporting on this Output for this Annual Report

Output #15

Output Measure

- Curricula/Instructional materials

Year	Actual

2013	1

Output #16

Output Measure

- Individual Consultations and Site Visits

Year	Actual
2013	552

Output #17

Output Measure

- Basic and Applied Research Projects

Year	Actual
2013	11

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Participants acquire knowledge and skill to promote, implement or participate in practices or programs that protect natural resources and ecosystems
2	Participants promote, implement or participate in practices or programs that protect natural resources and ecosystems
3	Participants acquire the knowledge and skills to implement pest management practices that minimize the impact on human health and the environment
4	Participants implement pest management practices that minimize the impact on human health and the environment
5	Participants acquire the knowledge and skills to implement sustainable land use and development practices
6	Participants implement sustainable land use and development practices
7	Creation and synthesis of knowledge related to the protection of natural resources and ecosystems
8	Participants acquire knowledge and skill to protect and enhance community resources and urban ecosystems

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	14367

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Massachusetts is the third most densely populated state in the nation. The rate of land consumption for residential development is steadily increasing far out of proportion to its population growth. Haphazard growth has impacted water resources, natural resource-based enterprises, open space, wildlife habitat, and community character. Nearly half the state's communities lack professional planning staff, while volunteer boards struggle with increasing levels of responsibility, liability, time demands and public mistrust.

What has been done
Outreach to landowners in the Mill River watershed; Serving as MA coordinator for the North American Amphibian Monitoring Program; Serving on the Quabbin Science and Technical Advisory Committee for a review of forest management practices; Serving on the New Jersey Habitat Protection Project Scientific Advisory Committee. Over the course of the past year five workshops, presentations or field trips on the topic of fish, wildlife and biodiversity conservation were conducted reaching 328 participants for a total of 565 contact hours.

Results
Participants increased knowledge of wildlife natural history and ecology, wildlife conservation issues, and techniques for protecting and enhancing wildlife habitat. Participants increased understanding and skill in the use of ecological assessments and natural resource inventories for conservation planning

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources

133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #3

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

Participants acquire the knowledge and skills to implement sustainable land use and development practices

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	688

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Forests cover over 60% of Massachusetts. The vast majority of those forests are owned by private families and individuals. The average age of family forest owners is over 60 years old. In the coming years, the future of our forested landscapes will be determined as this aging population decides what to do with their land. Their decisions will not only have a profound influence on the benefits their land provides their family, but also on the tremendous public benefits this land provides.

What has been done
Activities for the past year include: Landowner research to inform critical issues; Internet-based outreach; education and reference materials targeted towards community opinion leaders such as large landowners and members of municipal board members, watershed associations, and land trusts; creation and distribution of MA Forestry Best Management Practices Manual to ensure low-impact and sustainable timber harvesting.

Results
Landowners increased understanding of their land management options. The number of acres being managed by a MA licensed forester increased. An increased in the number of landowners and community leaders who understand the options for beginning the estate planning process and conserving land.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

Outcome #6

1. Outcome Measures

Participants implement sustainable land use and development practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	704

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

Outcome #7

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Participants acquire knowledge and skill to protect and enhance community resources and urban ecosystems

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	3846

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Massachusetts currently features a relatively large proportion of canopy cover in its three largest cities (Boston 29%, Worcester 37%, and Springfield 33%). Citizens are passionate about maintaining urban trees and community green space, and there are plans to increase urban tree populations and existing canopy cover. Community trees, however, are frequently presented with challenging growing conditions and there is little scientific data and consistent outreach education related to their survival and growth in urban environments.

What has been done
Key activities for the past year focused on conducting educational outreach via web-based and multi-media outlets. A large numbers of urban forest managers and tree care professionals were engaged through professional associations such as the Massachusetts Tree Wardens and Foresters Association and the New England Chapter of the International Society of Arboriculture. Increasingly targeted efforts were focused on collaborating directly with key individuals in various communities throughout Massachusetts who serve as Conservation Board Members.

Results
Significant progress was made towards increasing public knowledge regarding the importance of urban and community forests and their associated benefits. Initial efforts have been undertaken to understand and to measure how the these educational efforts can translate into decisions made and actions taken by key stakeholders (e.g. Tree Wardens) in their management of urban forest resources, which will inevitably effect the vitality of urban forests in communities throughout Massachusetts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
608	Community Resource Planning and Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

No results to report. Assessments in progress

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Massachusetts Center for Agriculture Administration

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

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

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	9.6	0.0	1.5	0.0
Actual Paid Professional	7.0	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
840129	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
385346	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
310297	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

2. Brief description of the target audience

University Administrators

Faculty
Staff
Growers
Food Industry
Agriculturists

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	150	150	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Administrative Initiatives, Systems and Procedures
  Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

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 Measures**

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

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected 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.)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

No formal assessments have been conducted.

Key Items of Evaluation