

**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**

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
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%		12%	
205	Plant Management Systems	22%		0%	
211	Insects, Mites, and Other Arthropods Affecting Plants	11%		12%	
212	Pathogens and Nematodes Affecting Plants	11%		6%	
216	Integrated Pest Management Systems	3%		0%	
304	Animal Genome	0%		8%	
311	Animal Diseases	0%		17%	
312	External Parasites and Pests of Animals	0%		27%	
502	New and Improved Food Products	0%		1%	
601	Economics of Agricultural Production and Farm Management	0%		7%	
602	Business Management, Finance, and Taxation	20%		0%	
605	Natural Resource and Environmental Economics	0%		1%	
723	Hazards to Human Health and Safety	3%		0%	
801	Individual and Family Resource Management	0%		1%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

<b>Year: 2012</b>	<b>Extension</b>		<b>Research</b>	
	<b>1862</b>	<b>1890</b>	<b>1862</b>	<b>1890</b>

Plan	13.4	0.0	2.6	0.0
Actual Paid Professional	11.8	0.0	3.0	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
555489	0	139169	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
464276	0	331956	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
823289	0	685028	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

- Basic and 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**

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	15373	337580	0	0

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

**Patent Applications Submitted**

Year: 2012  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2012	Extension	Research	Total
<b>Actual</b>	1	16	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Demonstrations

Year	Actual
2012	2

**Output #2**

**Output Measure**

- Displays and Exhibits

Year	Actual
2012	1

**Output #3**

**Output Measure**

- Facilitated Group Meetings and Conferences

<b>Year</b>	<b>Actual</b>
2012	306

**Output #4**

**Output Measure**

- Individual Consultations and Site Visits

<b>Year</b>	<b>Actual</b>
2012	2350

**Output #5**

**Output Measure**

- Printed Materials

<b>Year</b>	<b>Actual</b>
2012	17

**Output #6**

**Output Measure**

- Published Articles (New, Professional and Trade)

<b>Year</b>	<b>Actual</b>
2012	20

**Output #7**

**Output Measure**

- Single day workshop, presentation or event

<b>Year</b>	<b>Actual</b>
2012	62

**Output #8**

**Output Measure**

- Websites or other computer-based delivery

<b>Year</b>	<b>Actual</b>
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2012 148

**Output #9**

**Output Measure**

- Workshop series or educational course  
Not reporting on this Output for this Annual Report

**Output #10**

**Output Measure**

- Applied Research Projects

<b>Year</b>	<b>Actual</b>
2012	1

**Output #11**

**Output Measure**

- Diagnostic Services

<b>Year</b>	<b>Actual</b>
2012	1325

**Output #12**

**Output Measure**

- Academic Presentation/Poster

<b>Year</b>	<b>Actual</b>
2012	0

**Output #13**

**Output Measure**

- Published Articles (Academic)  
Not reporting on this Output for this Annual Report

**Output #14**

**Output Measure**

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

**Output #15**

**Output Measure**

- Basic Research Projects

<b>Year</b>	<b>Actual</b>
2012	20

**Output #16**

**Output Measure**

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

**Output #17**

**Output Measure**

- Survey, Needs Assessment, or Other Data Collection

<b>Year</b>	<b>Actual</b>
2012	1

**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	Accurate research on immunosuppression by tick saliva and vaccine development
6	Accurate research on Animal Genome Research acquired and shared
7	Participants adopt practices that lower the risk from and exposure to pesticides and fertilizers
8	Participants acquire knowledge and skills that lower the risk from and exposure to pesticides and fertilizers
9	Participants adopt practices that reduce the risk of exotic pests, diseases and invasive species
10	Participants acquire the knowledge and skill to 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**

<b>Year</b>	<b>Actual</b>
2012	2752

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Managed grass covered surfaces collectively comprise an integral part of our communities. Turf management practices have broad implications for water resources, property values, energy consumption, greenhouse gas mitigation, the safety of youth and adult sports participants, and the economic viability of businesses and communities. The development, communication and adoption of best management practices are critical for maintaining the quantity and quality of open space, and can positively impact ecosystem integrity in Massachusetts.

#### **What has been done**

A comprehensive array of workshops, courses, information streams, a website, educational presentations, field days, and site consultations addressed the implementation of Best Management Practices for environmentally sustainable turf. Activities focused on water and resource conservation through turf and irrigation practices; implementation of organic sports field and lawn management; increased and more effective use of Integrated Pest Management; and reduced use of pesticides through improved cultural practices.

#### **Results**

Participants reported they increased their knowledge and skills for strategies that protect water resources and environmental quality such as: the use of new crop coefficients; selection and improvement of drought tolerant turfgrass species and improvement of irrigation; and soil management strategies aimed at reducing water consumption. They also reported increases in knowledge regarding Best Management Practices and Integrated Pest Management with emphasis on sustainability and environmental protection such as: effective and environmentally responsible use of compost; transitioning to and managing minimum maintenance; and strategies for management of pests on school properties using an IPM, low-risk plan.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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**

<b>Year</b>	<b>Actual</b>
2012	1546

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Managed grass covered surfaces collectively comprise an integral part of our communities. Turf management practices have broad implications for water resources, property values, energy consumption, greenhouse gas mitigation, the safety of youth and adult sports participants, and the economic viability of businesses and communities. The development, communication and adoption of best management practices are critical for maintaining the quantity and quality of open space, and can positively impact ecosystem integrity in Massachusetts.

#### **What has been done**

A comprehensive array of workshops, courses, information streams, a website, educational presentations, field days, and site consultations addressed the implementation of Best Management Practices for environmentally sustainable turf. Activities focused on water and resource conservation through turf and irrigation practices; implementation of organic sports field and lawn management; increased and more effective use of Integrated Pest Management; and reduced use of pesticides through improved cultural practices.

#### **Results**

Participants who identified themselves as being responsible for budgeting and purchasing in their business, organization or municipality, indicated that as a result of the information and resources provided by UMass Extension, they were able to make better economic and environmentally

sustainable decisions in relation to the purchase of turf management materials.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
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

<b>Year</b>	<b>Actual</b>
2012	928

##### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
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**

Accurate research on immunosuppression by tick saliva and vaccine development

Not Reporting on this Outcome Measure

**Outcome #6**

**1. Outcome Measures**

Accurate research on Animal Genome Research acquired and shared

Not Reporting on this Outcome Measure

**Outcome #7**

**1. Outcome Measures**

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

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2012	374

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

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## What has been done

### Results

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
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 #8

##### 1. Outcome Measures

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

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2012	757

##### 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**

Pesticide certification study manuals were distributed by the UMass Extension Bookstore to approximately 1700 individuals preparing for the state administered pesticide exams. The Pesticide Education program conducted twenty-six, two-day workshops to help individuals

prepare for the Massachusetts state pesticide license exams.

### **Results**

Individuals who participated in the preparatory workshop continue to pass the exam at a higher rate than those who did not take the workshop. In the past year, 61% of the individuals who participated in the workshop passed the exam, compared to a passing rate of 56% for non-participants.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
133	Pollution Prevention and Mitigation
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

### **Outcome #9**

#### **1. Outcome Measures**

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

Not Reporting on this Outcome Measure

### **Outcome #10**

#### **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

#### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2012	847

#### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Nursery and greenhouse production is one of the most important agricultural commodities in the state. There are more than 5,000 firms involved in these services. These companies together have significant economic and environmental impacts for Massachusetts. The success of their industry is increasingly tied to managing the risks posed by exotic pests, diseases and invasive species.

**What has been done**

Activities included: grower consultations; educational workshops and conferences and other presentations by Extension Faculty and Professional Staff; exhibits at two trade shows; articles, publications and newsletters; and maintaining up-to-date information on websites.

**Results**

Growers gained considerable knowledge about diseases of greenhouse crops. One specific area was knowledge related to Impatiens Downy Mildew, a new and economically important disease for Massachusetts growers. Over 200 growers collected written publications and talked one-on-one with Extension staff who were exhibiting information on Impatiens Downy Mildew at two grower trade shows. Many additional growers received one-to-one assistance diagnosing problems with other greenhouse crops and learned to identify various insects, diseases and cultural problems.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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**

According to post program surveys participants reported increased their knowledge and skills in Conservation strategies that protect water resources and environmental quality and for other Integrated Pest Management practices that enhance environmental sustainability and protection.

Growers reported changing specific fertilizer practice as a result of attending the plant nutrition education programs developed knowledge and skills to identify insects, diseases and cultural problems.

In the past year, 61% of the individuals who participated in the workshop passed the exam, compared to a passing rate of 56% for non-participants. This is nearly a 10% overall difference in the passing rate between the two groups

A total of 1,310 individuals participated in pesticide recertification training sessions. Of the 990 individuals who completed evaluations, 71% indicated that they increased their knowledge, "very much" and 61% indicated strong intentions to use the information/techniques that they learned.

### **Key Items of Evaluation**

Growers gained considerable knowledge about Impatiens Downy Mildew, a relatively new and economically significant disease for Massachusetts growers.