

**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%		2%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		1%	
202	Plant Genetic Resources	0%		2%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		6%	
204	Plant Product Quality and Utility (Preharvest)	11%		0%	
205	Plant Management Systems	10%		5%	
206	Basic Plant Biology	0%		6%	
211	Insects, Mites, and Other Arthropods Affecting Plants	13%		5%	
212	Pathogens and Nematodes Affecting Plants	13%		13%	
216	Integrated Pest Management Systems	23%		0%	
301	Reproductive Performance of Animals	0%		13%	
303	Genetic Improvement of Animals	0%		11%	
304	Animal Genome	0%		3%	
307	Animal Management Systems	7%		0%	
311	Animal Diseases	0%		22%	
601	Economics of Agricultural Production and Farm Management	6%		1%	
604	Marketing and Distribution Practices	6%		2%	
701	Nutrient Composition of Food	0%		1%	
703	Nutrition Education and Behavior	0%		1%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%		6%	
	<b>Total</b>	100%		100%	

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

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

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	11.9	0.0	9.6	0.0
Actual Paid Professional	14.1	0.0	11.9	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
325125	0	487049	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
856273	0	1105484	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
553581	0	1684289	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)
- Basic and 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?**

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>	9001	10307	123	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>	10	56	0

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

**Output Target**

**Output #1**

**Output Measure**

- Demonstrations

Year	Actual
2012	10

**Output #2**

**Output Measure**

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

**Output #3**

**Output Measure**

- Facilitated Group Meetings and Conferences

<b>Year</b>	<b>Actual</b>
2012	11

**Output #4**

**Output Measure**

- Individual Consultations and Site Visits

<b>Year</b>	<b>Actual</b>
2012	946

**Output #5**

**Output Measure**

- Printed Materials

<b>Year</b>	<b>Actual</b>
2012	12

**Output #6**

**Output Measure**

- Single day workshop, presentation or event

<b>Year</b>	<b>Actual</b>
2012	95

**Output #7**

**Output Measure**

- Websites or other computer-based delivery

<b>Year</b>	<b>Actual</b>
2012	52

**Output #8**

**Output Measure**

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

**Output #9**

**Output Measure**

- Published Articles (Academic)

<b>Year</b>	<b>Actual</b>
2012	10

**Output #10**

**Output Measure**

- Applied Research Projects

<b>Year</b>	<b>Actual</b>
2012	12

**Output #11**

**Output Measure**

- Basic Research Projects

<b>Year</b>	<b>Actual</b>
2012	47

**Output #12**

**Output Measure**

- Academic Presentation or Poster

<b>Year</b>	<b>Actual</b>
2012	7

**Output #13**

**Output Measure**

- Published Articles (New, Professional or Trade)

<b>Year</b>	<b>Actual</b>
2012	29

**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	Accurate research on vegetable pests made available and shared
8	Accurate research on Bee Health made available and shared
9	Accurate research on soil based residuals, reclaimed, wastewater made available and shared
10	Creation and synthesis of knowledge related to Global Food Security and Hunger

## **Outcome #1**

### **1. Outcome Measures**

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

### **2. Associated Institution Types**

- 1862 Extension

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2012	430

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

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

In the past ten years, Cranberry growers have gone from receiving record high prices for their fruit to record low prices. Although the industry has rebounded, 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 environmentally sound and economically competitive.

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

Our program of integrated research and outreach education for Cranberry growers continued. Research for the past year focused on: automated irrigation cycling, upright dieback caused by *Phomopsis vaccinii*, reduction in the use of phosphorus and efficacy trials with the new insecticide. Results were communicated to growers through a series of well-attended meetings, printed materials and web-based resources.

#### **Results**

Growers increased their knowledge and skills related to canopy management strategies, such as sanding and pruning and irrigation management. Growers learned how to apply pesticides to their farms in accordance with state and federal regulations. They also learned how to incorporate the use of reduced-risk compounds for pest management and to implement a variety of additional practices that maintain health and productivity of their farms in a cost-effective ways.

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

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
204	Plant Product Quality and Utility (Preharvest)

205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

## **Outcome #2**

### **1. Outcome Measures**

Participants adopt practices that ensure economically viable food production

### **2. Associated Institution Types**

- 1862 Extension

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2012	496

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

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

Immigrants who have relocated to Massachusetts from places like Guatemala, Mexico, El Salvador or Brazil are interested in foods that preserve a connection to their native lands. The range of ethnic crops that are now in production are helping individuals from New England communities that are at-risk for obesity and other food-related health problems to increase consumption of fresh produce, while also providing a significant boost to Massachusetts farmers.

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

New produce varieties from Central and South America that are strong candidates for being able to survive in colder northern climates are identified. Trial plots are set up on the UMass Research Farm. After the crop is established, potential markets are assessed and local growers are enlisted to produce and sell these new varieties on a large scale.

#### **Results**

A variety of new "ethnic" crops (e.g. Chipilín, Taioba, and Maxixie) have been brought to market in Western Massachusetts and in farmer's markets, neighborhood groceries and supermarkets in and around Boston. Since 2000, assessed sales for crops that had not previously been cultivated in the United States has been estimated at over \$5,000,000.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

#### **Outcome #3**

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

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

Not Reporting on this Outcome Measure

#### **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**

<b>Year</b>	<b>Actual</b>
2012	405

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

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

Fruit farms and vineyards provide open space and scenic vistas that add significantly to the quality of life in Massachusetts. The lands surrounding agricultural production provide buffer

zones for native species of plants and animals and corridors for their movement or expansion. Growers, their neighbors and consumers all benefit from crops that are produced in ways that are environmentally sustainable.

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

Growers have been provided with access to current research information on new and alternative species and varieties, advanced horticultural management techniques, pest-ecology, and pest-management procedures. Related research on pest ecology and management informs approaches that optimize control, reduce chemical use and increase fruit quality.

#### **Results**

Growers adopted integrated crop management practices that minimized the risks to both people and the environment. This included the use of innovative technologies and pest management tactics, as well as switching to reduced-risk pesticides. Details on the specific practices they adopted are outlined in the New England Small Fruit Pest Management Guide, New England Small Fruit BMP manual, the New England Crop Profiles and USDA Pest Management Strategic Plans.

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

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
307	Animal Management Systems

#### **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**

Accurate research on vegetable pests made available and shared

Not Reporting on this Outcome Measure

### **Outcome #8**

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

Accurate research on Bee Health made available and shared

Not Reporting on this Outcome Measure

### **Outcome #9**

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

Accurate research on soil based residuals, reclaimed, wastewater made available and shared

Not Reporting on this Outcome Measure

### **Outcome #10**

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

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

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**

Evaluation methods include web-based and hand-written surveys, as well as checklists, interviews and reviews of existing data. Formal evaluations are supplemented by anecdotal reports, case studies, testimonies and simple observations.

Dairy and livestock producers adopted management practices that reduce off-farm purchase of fertilizers and minimized non-point source pollution. They also increase their knowledge to produce and use alternative energy sources that reduce fossil fuel consumption on their farm. Orchards owners used more reduced-risk pesticides and environmentally sound pest control tactics. Vegetable growers learned about and employed methods for producing world crops that are new to New England. Cranberry growers implemented practices that maintain health and productivity of their farms in a cost-effective ways that enhanced crop production. These included canopy management strategies, improved irrigation techniques and increased use of reduced-risk compounds for pest management .

### **Key Items of Evaluation**