

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

#### Program # 4

##### 1. Name of the Planned Program

Connecticut Green Industries

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	5%		5%	
111	Conservation and Efficient Use of Water	5%		0%	
112	Watershed Protection and Management	5%		5%	
131	Alternative Uses of Land	10%		0%	
132	Weather and Climate	5%		0%	
135	Aquatic and Terrestrial Wildlife	5%		0%	
136	Conservation of Biological Diversity	0%		5%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		10%	
202	Plant Genetic Resources	0%		10%	
205	Plant Management Systems	20%		10%	
206	Basic Plant Biology	0%		10%	
216	Integrated Pest Management Systems	25%		25%	
601	Economics of Agricultural Production and Farm Management	10%		5%	
605	Natural Resource and Environmental Economics	5%		10%	
607	Consumer Economics	5%		5%	
	<b>Total</b>	100%		100%	

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

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

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	3.7	0.0	0.5	0.0
<b>Actual Paid</b>	4.1	0.0	0.7	0.0
<b>Actual Volunteer</b>	1325.0	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
365988	0	242002	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
365988	0	242002	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
841745	0	817821	0

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

**1. Brief description of the Activity**

The green industry planned program focused on developing new tools and technologies that promote safe and healthy green spaces across Connecticut. Research and extension programs focused on Integrated Pest Management (IPM) approaches for schools and other municipal areas. Programs also addressed tools and techniques for groundskeepers to improve management of recreational areas.

Activities included:

- on-line material such as fact sheets, impact statements and news articles
- workshops and webinars
- YouTube videos, and mobile apps.
- trainings and individual counseling and assessments
- basic and applied research projects

**2. Brief description of the target audience**

Consumers, agricultural businesses, community agencies and organizations, greenhouse, nursery and landscape businesses.

**3. How was eXtension used?**

UConn Extension's Home and Garden Education Center is the Northeast Regional First Responder to eXtension 'Ask the Expert' questions, 176 questions from the National eXtension 'Ask the Expert' were routed and answered by the Center this past year.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	16310	673949	629	40

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

**Patent Applications Submitted**

Year: 2014  
 Actual: 3

**Patents listed**

1. Butterfly bush variety - "Summer Skies"
2. Apparatus, System and Method for Mechanical, Selective Weed Control in Mature and Establishing Turfgrass Strands.
3. Methods to produce animal browsing resistant plants.

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
Actual	5	29	34

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

**Output Target**

**Output #1**

**Output Measure**

- Conferences, workshops, short courses, and reports.

Year	Actual
2014	214

**Output #2**

**Output Measure**

- New or updated web page(s)

Year	Actual
2014	4

**Output #3**

**Output Measure**

- Number of undergraduate and graduate students and Post Doctoral Researchers trained

Year	Actual
2014	150

**Output #4**

**Output Measure**

- Webinars conducted

<b>Year</b>	<b>Actual</b>
2014	7

**Output #5**

**Output Measure**

- YouTube videos produced

<b>Year</b>	<b>Actual</b>
2014	0

**Output #6**

**Output Measure**

- Apps developed

<b>Year</b>	<b>Actual</b>
2014	1

**Output #7**

**Output Measure**

- Clinical, extension or other expert services

<b>Year</b>	<b>Actual</b>
2014	456

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Participants in attendance at green industry planned program activities adopting best management practices.
2	Increase awareness of sustainable practices that benefit the local and regional economy.
3	Improve urban and community horticulture
4	Enhance adaptive capacity of proper soil nutrient management

## **Outcome #1**

### **1. Outcome Measures**

Participants in attendance at green industry planned program activities adopting best management practices.

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

- 1862 Extension
- 1862 Research

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	4000

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

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

Greenhouse and nursery products (ornamental shrubs, flowers, young plants) are Connecticut's leading source of agricultural income. Approximately 300 commercial greenhouse businesses have 8 million square feet of production space under cover. In addition, many Connecticut farmers have added greenhouse crops to their businesses to increase income. This audience needs education on proper pesticide management, alternative controls, enhancing and conserving environmental quality and improving profitability.

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

Integrated Pest Management (IPM) integrates the application of multiple tactics in a variety of settings through the selection of appropriate tools and the education of members of CT industry and citizens to provide sustainable, science-based approaches for the management of plant pests (insects, mites, diseases, wildlife, and weeds, including invasive plants). Program objectives include maintaining the economic viability of agricultural and green industry businesses, enhancing and conserving environmental quality and natural resources, educating participants on the effective use of biological control agents, and educating pesticide users about the safe use and handling of pesticide products.

IPM Program team members conducted intensive on-site educational training for garden center owners, greenhouse growers, nursery producers and retailers, and turf and landscape professionals. Growers and green industry professionals received information on the current status and recommendations for important plant pests and training via pest messages, email alerts, webinars, newsletters, articles in national trade journals, websites, social media, consultations via phone, site visits to their operations, workshops and conferences.

## Results

Broader adoption of IPM practices enhanced responsible pest management and reduced management and production costs; minimized adverse environmental and economic effects from pests; resulted in improved ecosystem quality and plant performance; and improved plant health, quality, yields, and aesthetics.

\* Approximately 1,285 pesticide applicators and occupational users were provided with training on the safe use and handling of pesticide products, including those who earned pesticide recertification credits. Approximately 4,000 non-certified people received pesticide safety training.

\* 38 growers and landscape professionals adopted IPM practices and acquired relevant information on and increased awareness of existing and emerging pests to improve production, crop quality, profitability, and aesthetics.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
131	Alternative Uses of Land
136	Conservation of Biological Diversity
205	Plant Management Systems
216	Integrated Pest Management Systems
605	Natural Resource and Environmental Economics
607	Consumer Economics

## Outcome #2

### 1. Outcome Measures

Increase awareness of sustainable practices that benefit the local and regional economy.

### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

### 3a. Outcome Type:

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2014	100

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

The Green Industry within the U.S. provides critical economic activity associated with not only the sale of nursery and greenhouse projects, but also via the impact the value chain and services associated with the industry. As such, Connecticut and the Northeast, has a tremendous opportunity to service a large population, thereby creating a direct impact on the local and regional economy.

#### What has been done

Through a better understanding of the value chain, a Hatch Multistate research project is addressing specific issues affecting the Green Industry in order to create efficiencies within the movement of goods, enhance the competitiveness of domestic product, or to facilitate better decision making via more information for policy makers and industry. A study examined the role labeling perceptions (local, sustainable, organic and eco-friendly) drive consumers purchase decisions.

#### Results

Analysis of surveys and economic experiments that address the issue of perceptions and preference for labeling, show that consumers are confused about the definitions of many labels (e.g. local, sustainable, organic, eco-friendly), but these labels do drive the purchase decision for many consumers. Over 100 industry professionals in CT attended a workshop presentation on the influences of labeling and gained new knowledge about the impact labeling has on consumer purchasing decisions. Many indicated they will improve their labeling practices in order to decrease consumer confusion about labeling terms.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
607	Consumer Economics

### Outcome #3

#### 1. Outcome Measures

Improve urban and community horticulture

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2014	21000

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Most American citizens are more than two generations removed from the farm. There is a strong public support to protect and enhance the natural, historical and developed environment. With the proper education, actions taken at the individual level can have positive environmental and community consequences. The Master Gardener Program is designed to address these sorts of actions as well as provide CT citizens with timely, effective and accurate responses to their home and garden queries. The program emphasizes urban and community horticulture, and historical and sustainable landscapes.

#### What has been done

The following activities were conducted in the Master Gardener Program:

- \* Conducted a nine-month training program for 180 citizens
- \* Conducted 92 one-time Master Gardener classes on consumer horticultural topics for the public
- \* Provided expert advice through office hours/telephone/internet and a hotline for consumer gardening questions and concerns
- \* Conducted Garden talks to library, garden and other community groups
- \* Provided volunteer support for community and other production gardens
- \* Provided outreach to gardeners at area fairs and other public events
- \* Provided volunteer support and teaching projects with other community gardening projects, historical gardens and school gardens

#### Results

Results from the Master Gardener Program include:

- \* 171 people completed Master Gardener training
- \* 100,700 contacts with members of the public via, telephone, mail and walk-ins resulted in the diagnosis of a wide variety of plant cultural, insect and disease problems.
- \* 2082 people attended 92 Garden Master Classes as part of the Advanced Master Gardener Program. These classes are offered to the public as well as Master Gardeners.
- \* Master Gardeners Interns volunteered over 5,600 hours at the County Extension offices and the Bartlett Arboretum and volunteered over 5,900 hours in community outreach projects providing education and assistance to CT gardeners
- \* Certified Master Gardeners volunteered over 21,000 hours in the community and at County Extension offices.
- \* Participants in classes report they intend to change an assortment of gardening practices as a result of material presented

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems

206 Basic Plant Biology

#### **Outcome #4**

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

Enhance adaptive capacity of proper soil nutrient management

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

- 1862 Extension
- 1862 Research

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	12196

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

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

The Soil Nutrient Analysis Laboratory addresses several environmental and health issues by conducting analysis of soil and tissue samples from commercial and residential individuals throughout Connecticut. Legislation governing the application of phosphorus to established lawns was enacted in January, 2013. Phosphorus is the largest contribution to pollution of Connecticut's fresh water systems. Soil analysis can provide agricultural producers and residential consumers guidance on environmentally sound fertilizer recommendations to protect water systems and provide cost savings through best management practices. Additionally, on average 19% of home vegetable gardens are found to have elevated soil lead levels. It is essential to educate home gardeners about the risks of lead poisoning and mitigation strategies.

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

A total of 12,196 soil and tissue samples were analyzed from July 1, 2013 to June 30, 2014. Standard soil fertility tests were performed on 8,263 soils for home grounds recommendations, 1,802 soils for commercial growers and 260 research soil samples. The lab also ran 1293 miscellaneous analyses for pH, mechanical analysis, organic matter and soluble salts, 644 pre-side dress soil nitrate tests (PSNT), 223 cornstalk nitrate analyses, and 852 plant tissues. The laboratory is working towards implementation of a new soil test recommendation program which was developed in conjunction with the University of Massachusetts' and University of Vermont's laboratory.

###### **Results**

In FY 2014, 12,196 soil tests provided individuals with knowledge on how to apply the proper quantities of limestone and fertilizer and how to do so in an environmentally sound manner. If fertilizers are applied as directed, the result should be reduced contamination of water sources. Since April of 2007, all soils receiving the standard nutrient analysis are screened for lead. In 2104, 263 clients with elevated levels of soil lead received fact sheets that address lead health concerns and discuss soil remediation techniques. More Connecticut residents learned about the benefits of soil testing and proper soil nutrient management through the Laboratory's website, [www.soiltest.uconn.edu](http://www.soiltest.uconn.edu) and a recently created Facebook page. Increased social media presence improved the laboratory's visibility and made it easier for the public to find information of soil testing. In addition, Soil Nutrient Analysis Laboratory performed analysis on 1,159 soil and plant tissue samples from UConn's Plant Science and Landscape Architecture Department, saving the Department approximately \$14,000 in analytical expenses.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
205	Plant Management Systems
206	Basic Plant Biology

#### 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
- Populations changes (immigration, new cultural groupings, etc.)

##### Brief Explanation

#### V(I). Planned Program (Evaluation Studies)

##### Evaluation Results

1. Outcome measure: Increase awareness of sustainable practices that benefit the local and regional economy. Hatch Multistate project results were presented to a wide variety of academic and industry professionals. With respect to industry professionals, over 100 industry professionals in CT alone attended one of the workshops/presentations. Based on survey feedback from attendees at the sessions, a majority of participants indicated they were now more aware of how their labeling impacts decision making, and many

indicated they would increase labeling and highlight what their firm means by better defining their use of label terms of local, sustainable, organic, or eco-friendly. However, the research impact goes beyond the industry as results were also picked up by Time.com and the Huffington Post as well as being published in Today's Garden Center and Greenhouse Grower magazines.

2. IPM programs were evaluated by the following methods: pre- and/or post-program surveys, focus groups, key informant interviews, and testimonials.

3. Master Gardener program participants take pre- and post-tests to gauge knowledge. Post-class evaluations collected for all individual classes and for the Master Gardener Program as a whole. Advanced Master Gardener class members participate in post- class evaluations

### **Key Items of Evaluation**