

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

**Program # 2**

**1. Name of the Planned Program**

Food and Agriculture

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	10%			
205	Plant Management Systems	20%			
211	Insects, Mites, and Other Arthropods Affecting Plants	30%			
212	Diseases and Nematodes Affecting Plants	10%			
216	Integrated Pest Management Systems	20%			
315	Animal Welfare/Well-Being and Protection	10%			
	<b>Total</b>	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>	18.0	0.0	0.0	0.0
<b>Actual Paid</b>	18.0	0.0	0.0	0.0
<b>Actual Volunteer</b>	18.0	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
368595	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
368595	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1762904	0	0	0

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

**1. Brief description of the Activity**

Workshops/conferences - including single- and multi-day conferences, Farm and Forest events, and various producer association meetings  
 Pasture walks & twilight meetings  
 Farm/site visits, including kitchen table meetings and private consultations  
 On-farm and university-based applied research projects  
 Phone consultations  
 Pesticide Applicator Training  
 Soil and plant tissue diagnostic services  
 Publications - newsletters, news releases, fact sheets, publications, web page  
 Radio and TV spots

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

Farmers/producers, people who work in agriculture-related fields, homeowners, nursery/greenhouse managers

**3. How was eXtension used?**

Ask an Expert is often used to help volunteers answer Home and Garden Questions

**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>	36646	213410	1063	0

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

Year: 2014  
 Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
Actual	0	0	0

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

**Output Target**

**Output #1**

**Output Measure**

- One-on-one education: - Site visits - Phone, email, video chats and walk-in clients - One-on-one assistance to develop management or business plans

Year	Actual
2014	3519

**Output #2**

**Output Measure**

- Number of people served by diagnostic/ID services

Year	Actual
2014	1078

**Output #3**

**Output Measure**

- Number of people reached through educational Workshops or Conferences

Year	Actual
2014	24529

**Output #4**

**Output Measure**

- Number of people reached through monitoring/scouting and sharing of pest data

<b>Year</b>	<b>Actual</b>
2014	266

**Output #5**

**Output Measure**

- Number of Master Gardeners working on behalf of Cooperative Extension

<b>Year</b>	<b>Actual</b>
2014	288

**Output #6**

**Output Measure**

- Number of people reached through print educational information

<b>Year</b>	<b>Actual</b>
2014	6691

**Output #7**

**Output Measure**

- Number of people reached through on-line/web-based information

<b>Year</b>	<b>Actual</b>
2014	4662

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

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

O. No.	OUTCOME NAME
1	Number of NH growers who adopt new production practices, crops or crop varieties that help them to reduce labor, increase crop quality and/or increase profits.
2	Number of NH growers who report improved forage yield and quality
3	Number of NH growers who monitor for pests, use cultural practices to manage pests and/or select reduced-risk (lower EIQ) materials to manage pests
4	Number of NH producers who improve animal health and comfort
5	Number of growers that calibrate their sprayers
6	Number of greenhouse plant growers who base nutrient management decisions on soil, substrate, tissue and water testing

## **Outcome #1**

### **1. Outcome Measures**

Number of NH growers who adopt new production practices, crops or crop varieties that help them to reduce labor, increase crop quality and/or increase profits.

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

- 1862 Extension

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	117

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

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

Pests (weeds, insects and diseases) can limit farm profitability through reduced yields. Research-based information about how to identify, diagnose or prevent pest problems can reduce costs and environmental impact of pest control strategies. Soil tests and plant tissue tests are tools that help growers determine nutrient availability and crop needs. New growing practices (including new varieties, new crops, season extension, and more) can increase farm profitability through diversification, improved yields, and improved crop quality.

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

Educational programming for Fruit and Vegetable producers focused on twilight meetings, site visits, workshops, written publications/newsletters, research field days as well as services such as soil/tissue testing, plant diagnosis, insect identification and Integrated Pest Management (IPM) programs.

#### **Results**

Fifty vegetable, berry and tree fruit growers were surveyed using a Qualtrics survey distributed to commercial grower mailing lists in November 2014. Significant impacts include:

-A high percentage of growers reported that programs including meetings, workshops, and on-farm twilight meetings sponsored by UNHCE helped them increase their ability to identify, diagnose or manage pests (54%), adopt or try new methods of preventing or managing pests (52%), adopt or try new growing practices (48%), increase their knowledge of nutrient management (40%), and improve profitability (44%).

-Over 40% of growers reported that direct contact with a UNHCE county educator or UNHCE specialist helped them to increase their ability to identify, diagnose or manage pests, and over 30% reported that direct contact with a UNHCE county educator or UNHCE specialist helped

them try new methods of managing pests, increase knowledge of nutrient management, and improve profitability.

-Our publications, including the New England Vegetable, Small Fruit and Tree Fruit Management Guides, helped growers increase their ability to identify, diagnose or manage pests (56%), increase their knowledge of nutrient management (38%), or adopt or try new growing practices (22%). 38% of growers said that these tools helped them become more profitable.

-Growers reported that the our online tools, including the UNHCE Vegetable and Fruit Newsletter, the NH IPM Newsletter, and our Website increased their ability to identify, diagnose or manage pests (58%), adopt new methods of preventing or managing pests (44%), increased knowledge of nutrient management (20%), and helped them adopt or try new growing practices (34%). 36% of growers said that these tools help increase their profitability.

-Growers reported that the NH Apple IPM Hotline, Arthropod Identification, and the Plant Diagnostic Lab services helped them identify, diagnose or manage pests (44%), and ultimately, improve profitability of their operation (36%).

-60% of respondents (30 growers) cited specific changes that they implemented on their farm as a result of UNHCE activities (including all of the above). These changes ranged from changes in their marketing strategies (4%) to changes in nutrient management plants (26%), cultural practices (40%) and pest management practices (46%).

-80% of the growers that made changes reported that these changes helped their bottom line, by reducing fertilizer use (4%) to reducing labor (16%), saving input costs (14%) to increasing returns (26%) and decreasing pesticide use (28%).

#### 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

Number of NH growers who report improved forage yield and quality

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
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2014

21

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Animal production is an important part of New Hampshire agriculture that includes commercial farms in a wide range of scales and production systems, and small-scale "homestead" operations focused on limited marketing or home food production. The value of products from dairy, livestock, and poultry operations from these farms across the state exceeds \$116 million. The forage, pasture, and silage corn crops that support this sector covers more than 100,000 acres, more than 90 percent of the cropland in the state. For these farms to be profitable, producers need information that help them adopt practices in raising healthy animals, managing their operations as efficient businesses, and producing crops in a manner that protects soil and water resources. Cover crop seedings are difficult to use in northern locations since the late removal of the principal annual forage crop—field corn—leaves little time for the desired cover crop to establish successfully.

#### What has been done

- ?Cover crop-related topics at corn and forage meetings and spring crop meetings.
- ?No-till/equipment demonstration in Cheshire, Rockingham, and Strafford counties.
- ?Farm visits to discuss different aspects of the operation that could lead to better soil conservation or soil fertility management.
- ?Participating in CIG project, including a twilight meeting.
- ?Helped plan and implement Cover Crop/Soil Health Symposium with NRCS.

#### Results

- ?Survey results show 64 percent of respondents made changes in the way they raise their land as a result of Extension programming, including monitoring soil fertility and using results as the basis for fertilizer applications, use of cover crops, or adopting no-till techniques.
- ?Farms in Cheshire, Rockingham, Sullivan, Merrimack, and Grafton counties are experimenting with using cover crops for winter forage, with more than 1,000 acres signed up for aerial seeding across the state (mostly on field corn).
- ?In 2014, approximately 600 acres of field corn were grown with cover crops in Cheshire County, an increase of nearly 400 acres since 2009. Research in Massachusetts indicates that small grains established by mid- to late-September provide winter cover and prevents approximately 50 pounds of nitrogen per acre from leaching through the soil, so the present cropping practices conserve some 30,000 pounds of nitrogen that might otherwise find its way into surface and ground water. Additionally, by conserving this nitrogen, farmers save an estimated \$20,000 in fertilizer costs.
- ?One Cheshire County farm planted 200 acres of corn with no-till techniques after harvesting small grains.

### 4. Associated Knowledge Areas

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

315 Animal Welfare/Well-Being and Protection

**Outcome #3**

**1. Outcome Measures**

Number of NH growers who monitor for pests, use cultural practices to manage pests and/or select reduced-risk (lower EIQ) materials to manage pests

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2014	266

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

**Issue (Who cares and Why)**

NH consumers expect inexpensive, blemish-free produce, yet want farmers to avoid using pesticides! The Integrated Pest Management program helps growers handle this difficult situation by teaching growers to monitor pest levels, prevent pest problems, and rely on multiple control methods?not just artificial chemicals. New pests continue to challenge us every year. The main focus for the IPM program has been in fruit and vegetable production.

**What has been done**

We obtained grant funding from NIFA and NH Dept of Agriculture, Markets and Food. We set up networks of traps to monitor pest populations, and we provided information on IPM through a series of lectures, grower meetings, and farm visits. Our scouts checked traps weekly through the season. We provided color fact sheets and other references on line, and wrote 6 newsletters, delivered via email and posted on line. We provided a fruit pest update telephone that was accessible 24/7 during the growing season, and recorded 25 weekly update messages of 3-4 minutes each. Our team evaluated the program by statewide apple quality inspections, participant surveys, and an on line SWD grower survey.

**Results**

Apples: The 2014 incidence of pest injury on fruit at harvest was 2.76%, about ¼ the pre-IPM level. Growers still make far fewer pesticide applications than their pre-IPM records show. Weather was partly responsible for the \$110,000 reduction in spraying apples statewide. The total fruit crop was probably 350,000 bushels, so the reduction in fruit damage is estimated at \$40,000. Total statewide impact: \$150,000.

Spotted Wing Drosophila: in 2012, we had \$1.5M in losses to this new small fruit and stone fruit pest. In 2013 we helped NH growers reduce those losses by 2/3. 2014 data show similar losses. The biggest impacts are in blueberries and brambles.

Sweet corn: We compile impact data from growers in winter, so the figures below are for 2013. Growers in the IPM program made 2.35 fewer applications of insecticide, compared to their previous methods. That totaled \$18,738 in pesticide, and \$15,615 for labor and equipment costs. Growers also reduced their culling (throwing away insect-infested ears) by \$239,852. The total measured impact was \$274,206. There were additional unmeasured savings in peppers and chrysanthemums.

Cucurbits: The program reduced insecticide spraying by nearly \$5,000. It helped giant pumpkin growers, but it is difficult to measure that value in dollars. When late borers attack fruit, the damage can disqualify championship fruit from competition.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Diseases and Nematodes Affecting Plants
216	Integrated Pest Management Systems

#### Outcome #4

##### 1. Outcome Measures

Number of NH producers who improve animal health and comfort

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2014	20

##### 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>
315	Animal Welfare/Well-Being and Protection

**Outcome #5**

**1. Outcome Measures**

Number of growers that calibrate their sprayers

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	11

**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>
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems

## **Outcome #6**

### **1. Outcome Measures**

Number of greenhouse plant growers who base nutrient management decisions on soil, substrate, tissue and water testing

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

- 1862 Extension

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	154

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

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

Landscape and greenhouse horticulture is the largest sector of New Hampshire's agricultural economy with sales and services valued at \$276 million. Over 1,100 businesses, employing over 12,000 people, are involved in plant production, retail sales and landscape services including lawn maintenance and tree care. Through understanding and adopting these practices consumers, landscapers and garden centers will save money and enhance ecosystem services, which will benefit the environment.

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

UNH Cooperative Extension provides soil testing services as well as recommendations (based on the analysis) to professionals as well as homeowners. Last year, 100 fertilizer recommendations were made for greenhouses and commercial landscapers, while 1688 lawn soils tests were done for homeowners. Further, educational programs, workshops and site visits to commercial producers drive home the importance of soil fertility. Further mobile app tools have been developed to assist with calculating correct fertilizer applications.

#### **Results**

As a result of a follow-up survey sent to professional horticulturists,  
-60% of 550 professional horticulturists learned a "moderate amount" or "a great deal" about soils, water and/or nutrient management by attending our programs. As a result, 43% (of those who learned) improved soil with compost or other amendments, 30% reduced phosphorus fertilizer applications, and 21% used more slow-release fertilizers.

-7% of those who responded indicated that they did save money by applying only the recommended amounts of amendments or no amendments at all.

-142 professional horticulturists changed their behavior by improving soil with compost or other

amendments, reducing phosphorus fertilizer applications, and/or by using slow release fertilizers. Since most of these professionals make multiple applications (up to hundreds each), it can be concluded that the acreage protected through changes in application behavior was multiplied many times over.

-A total of 154 survey respondents based their nutrient management decisions a result of attending workshops or doing soil tests.

#### 4. Associated Knowledge Areas

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

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

##### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Competing Programmatic Challenges

##### Brief Explanation

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

##### Evaluation Results

Follow up, on-line surveys

##### Key Items of Evaluation