

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Agricultural Resources

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	10%			
212	Pathogens and Nematodes Affecting Plants	10%			
216	Integrated Pest Management Systems	15%			
315	Animal Welfare/Well-Being and Protection	10%			
601	Economics of Agricultural Production and Farm Management	5%			
602	Business Management, Finance, and Taxation	10%			
604	Marketing and Distribution Practices	10%			
	Total	100%			

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	15.0	0.0	0.0	0.0
Actual Paid Professional	17.0	0.0	0.0	0.0
Actual Volunteer	5.2	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
402804	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
402804	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	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?

Resources from eXtension are shared via our website, particularly in areas we do not have staff expertise, such as equine and honey bees. In addition, we've begun marking several eXtension webinars to clientele, dairy goats, poultry and dairy cattle.

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	47610	197700	466	150

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
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of people attending pasture walks
 Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of farm/site visits, including kitchen table meetings and private consultations

Year	Actual
2012	1748

Output #3

Output Measure

- Number of people reached with agriculture information via radio and TV spots

Year	Actual
2012	197700

Output #4

Output Measure

- Number of people who attend twilight grower meetings

Year	Actual
2012	1841

Output #5

Output Measure

- Number of phone consultations regarding agricultural practices, home horticulture and miscellaneous agriculture topics

Year	Actual
2012	3964

Output #6

Output Measure

- Number of Pesticide Applicators attending recertification training

Year	Actual
2012	3194

Output #7

Output Measure

- Number of soil and plant analyses conducted by diagnostic labs

Year	Actual
2012	3403

Output #8

Output Measure

- Number of people reached through educational Workshops - Single & multi-day educational events such as grower schools, state-wide grazing events, etc.

Year	Actual
2012	23860

Output #9

Output Measure

- Number of people reached through conferences: Farm & Forest, Producer Association Meetings

Year	Actual
2012	7744

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of NH growers who adopt practices that improve farm productivity, quality of life, environmental conditions, and/or profitability.
2	Number of NH growers who submit soil and/or tissue tests to determine crop nutrient needs
3	Number of NH growers who formulate plans to guide their crop production, pest management, nutrient allocation, or farm management decisions
4	Number of NH growers who increase their skills, knowledge, and/or awareness of farm management techniques, risk management programs, or marketing practices
5	Number of NH growers who increase their knowledge, awareness, and/or skills in crop production practices
6	Number of NH growers who increase knowledge, awareness, and/or skills in pest management practices and technologies.
7	Number of NH growers who increase knowledge, awareness, and/or skills in new research, technology
8	Number of participants who increase their knowledge, awareness and/or skills in practices and technologies to increase the quality of athletic fields, public spaces and/or golf course conditions
9	Number of participants in home horticulture programs who gain skills that improve self-esteem, enable them to grow and preserve crops, adopt IPM practices and protect and enhance their environment.
10	Number of NH growers who increase their skills, knowledge or awareness in practices or methods related to dairy, livestock or equine production methods.

Outcome #1

1. Outcome Measures

Number of NH growers who adopt practices that improve farm productivity, quality of life, environmental conditions, and/or profitability.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	329

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

Number of NH growers who submit soil and/or tissue tests to determine crop nutrient needs

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	3403

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Number of NH growers who formulate plans to guide their crop production, pest management, nutrient allocation, or farm management decisions

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	321

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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 #4

1. Outcome Measures

Number of NH growers who increase their skills, knowledge, and/or awareness of farm management techniques, risk management programs, or marketing practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	382

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices

Outcome #5

1. Outcome Measures

Number of NH growers who increase their knowledge, awareness, and/or skills in crop production practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1155

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 (which employ over 12,000 people) are involved in plant production, retail sales and landscape services including lawn maintenance and tree care. The priorities of producers (greenhouse and nursery crops) and other green industry businesses are somewhat different than those of the consumer. Producers are focused on crop production and the economic viability of their businesses. However many nurseries and greenhouses are producing crops at less than optimal efficiencies. Labor, raw materials, and energy are becoming increasingly more expensive and/or are hard to source. Owners, operators and employees often lack sufficient knowledge and skills to maximize productivity while maintaining level or decreased inputs.

What has been done

During the months of August and September 2012 nine greenhouse energy audits were conducted in 7 of the 10 counties in New Hampshire. John Bartok, Agricultural Engineer - University of Connecticut, was hired to train four University of New Hampshire Cooperative Extension personnel to conduct walk-through greenhouse energy audits. The individuals trained include Brian Krug, Greenhouse/Floriculture Specialist, Nada Haddad, Rockingham County Educator, Margaret Hagen, Hillsborough County Educator, and Russ Norton, Carroll County Educator. Bartok assisted these individuals on four audits, giving guidance and instruction. Greenhouses audited were evaluated for heating and energy efficiency. Growers/owners were present during the audits and energy saving techniques specific to their operations were developed and explained. In addition each participant was given a written report that summarized the energy audit and suggestions to improve efficiencies. Growers were also advised on potential

grants and cost sharing programs to assist them with costs of any improvements. Follow-up in 2012 with each of these operations determined what suggestions were implemented and estimated the impact on energy conservation.

Results

Communication with greenhouses participating in the energy audits showed that 6 out of 9 participants made changes based on the recommendations provided in the fall 2011 reports. Most operations made changes that did not require large capital investments, although one installed a wood pellet furnace and another a wood-fired boiler. Instead of repairing an inefficient greenhouse, one operation is planning to tear it down in spring 2013 and replace it with a new house. All reported sealing gaps around doors, louvers and shutters using weather-stripping, foam or frames designed specifically for the openings. Three greenhouses moved thermostats to crop height, one insulated the hot water pipes and heater, one installed knee walls on all sides, one insulated an endwall, two either installed horizontal air flow fans or changed their configuration to prevent disease problems, one installed new windows in an older house, one installed insulation around a cement foundation, and one installed insulation around the benches. Greenhouses invested anywhere from \$60 to \$5,000 in improvements, and most estimated that they saved at least 10 to 15% in energy costs during the 2012 growing season.

In addition to the operation putting up a new house, 3 greenhouse operations plan to do the following in 2013: install new doors, replace a roof, and put IR plastic on 2 houses. All 6 operations who made improvements agreed that the visits and audit reports were helpful and were the catalyst for making changes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #6

1. Outcome Measures

Number of NH growers who increase knowledge, awareness, and/or skills in pest management practices and technologies.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
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2012

3467

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Pests (weeds, insects and pathogens) 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. This requires 1) correct identification of pests, and 2) an understanding of how pest and crop life cycles interact. Cultural controls include growing practices that favor crops while hindering pests. Chemical controls vary widely in terms of impacts on non-target organisms such as beneficial insects or humans, and the environment. Reduced-risk pesticides include both biological controls as well as chemicals that have fewer off-target effects than conventional pesticides.

What has been done

The goal of the Integrated Pest Management (IPM) program is to teach farmers how to manage pest problems in a more appropriate manner, without compromising crop yield or quality. We emphasize a 3 component approach: 1) monitoring conditions and pest populations 2) using cultural methods to suppress pest populations, and 3) prioritizing controls with the least environmental impact first.

During the 2012 growing season, thirty (30) fruit and vegetable farms at thirty-two farm sites in New Hampshire monitored for insect pests.

Twenty (20) of those farms monitored with pheromone traps for European Corn Borer, Corn Earworm and Fall Armyworm (sweet corn insect pests) at twenty-two (22) farm locations. Corn earworm and fall armyworm are unpredictable pests that can cause major damage to sweet corn because they blow in from the south and west.

Fifteen (15) of the farms monitored with pheromone traps for Squash Vine Borer. Squash Vine Borer is an insect pest of pumpkin, winter and summer squash. By trapping for Squash Vine Borer, growers were better able to determine when control measures were necessary to prevent damage to plants. Also, fifteen (15) giant pumpkin growers and gardeners monitored for Squash Vine Borer.

Sixteen (16) of the farms in New Hampshire monitored with traps for Spotted Wing Drosophila at seventeen (17) farm locations. By trapping Spotted Wing Drosophila, growers were better able to determine when control measures were necessary to prevent damage to the fruit.

Eight (8) orchards monitored with pheromone traps for Oriental Fruit Moth. Oriental Fruit Moth is an insect pest of peaches and apple and has not been a problem pest until recently at (10) orchard sites. Knowing the presence of Oriental Fruit Moth, orchardists were better able to determine when control measures were necessary to prevent damage to fruit trees.

Eight (8) orchards monitored with ten pheromone traps for each the Greater Peach Tree Borer and the Lessor Peach Tree Borer. Greater Peach Tree Borer and Lessor Peach Tree Borer are insect pests of peaches and other stone fruits and it has been a problem pest. Knowing the when presence of the Greater Peach Tree Borer and Lessor Peach Tree Borer are, orchardists were better able to determine when control measures were necessary to prevent damage to fruit trees.

Results

In apples, the incidence of pest injury at harvest this year was 3.0%. This is below the 25 year average of 5.28%, and well below the pre-IPM average of 10 to 12%. Growers still report that they sprayed much less than the pattern before we introduced IPM. NASS estimates the 2012 crop was 392,850 bushels (down due to spring freeze), so the reduction in pest injury saved NH apple growers an estimated \$112,000 while reduced spraying saved them \$100,000. In small fruit, damage from a new pest from China (spotted wing drosophila) eliminated the savings growers experienced from our IPM work in small fruits. Based on preliminary grower survey results, losses would have been 3 to 5 times higher, without our extensive educational efforts on this new pest. In sweet corn, pest levels were relatively low this year. For much of the season, we saved growers money by reducing (unnecessary) spraying that they otherwise would have done. During August and September, our program reduced culling (throwing out infested ears - worth \$5-6/dozen) by alerting growers to the moth flights. The total impact (spray savings plus culling reduction) was \$150,000. In squash and pumpkins, spray savings were low, about \$4,800.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Number of NH growers who increase knowledge, awareness, and/or skills in new research, technology

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Number of participants who increase their knowledge, awareness and/or skills in practices and technologies to increase the quality of athletic fields, public spaces and/or golf course conditions

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
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2012

230

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The reorganization over the past year did not call for filling the one position we had in this area so when this individual retired, we reduced the programming in this area significantly.

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #9

1. Outcome Measures

Number of participants in home horticulture programs who gain skills that improve self-esteem, enable them to grow and preserve crops, adopt IPM practices and protect and enhance their environment.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	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
205	Plant Management Systems
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #10

1. Outcome Measures

Number of NH growers who increase their skills, knowledge or awareness in practices or methods related to dairy, livestock or equine production methods.

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
- Competing Programmatic Challenges

Brief Explanation

With a significant state budget cut, loss of staff and organizational change, most programmatic goals were reached, however challenges to capacity still remain. State budget cuts to our partners in the Department of Agriculture also impact our ability to work with producers across the state.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Nothing additional

Key Items of Evaluation

Nothing new to report at this time.