

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Agriculture and Food Systems

- 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%		12%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		6%	
202	Plant Genetic Resources	3%		12%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		3%	
204	Plant Product Quality and Utility (Preharvest)	15%		5%	
206	Basic Plant Biology	10%		1%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		14%	
212	Pathogens and Nematodes Affecting Plants	5%		13%	
213	Weeds Affecting Plants	2%		2%	
215	Biological Control of Pests Affecting Plants	3%		8%	
216	Integrated Pest Management Systems	2%		3%	
301	Reproductive Performance of Animals	1%		5%	
302	Nutrient Utilization in Animals	6%		2%	
304	Animal Genome	2%		2%	
305	Animal Physiological Processes	0%		3%	
307	Animal Management Systems	16%		2%	
501	New and Improved Food Processing Technologies	1%		2%	
503	Quality Maintenance in Storing and Marketing Food Products	6%		1%	
604	Marketing and Distribution Practices	10%		1%	
610	Domestic Policy Analysis	8%		3%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Cornell University

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	358.7	0.0	11.0	0.0
Actual Paid	273.0	0.0	13.0	0.0
Actual Volunteer	3473.0	0.0	0.0	0.0

NY State Agricultural Experiment Station

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	358.7	0.0	11.0	0.0
Actual Paid	0.0	0.0	2.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Institution Name: Cornell University

Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2251819	0	2061551	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2251819	0	3857389	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

2. Institution Name: NY State Agricultural Experiment Station

Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	988680	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	1254324	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

Our research and education is directed toward improvement of food system as a whole from farm to table. Cooperative Extension (CCE) and applied research programs work together to cover multiple aspects of agriculture and food systems such as soil resources and soil health, crop plant genomics, field evaluation of crops, reliable production guidelines, genetic improvement of animals and animal production, economics of production and farm management, integrated pest management, healthy produce, fruit and vegetable production and storage and facilitation of sustainable agriculture. Education complements research by encouraging farmers to grow new crop varieties and employ new production and business practices, through programs for agriculture sector businesses, and by informing consumers about new or improved food products. Research analysis and education also affect policies to reform governmental food and agriculture related programs.

Cornell University has a commitment to agriculture, horticulture, and natural resources enterprises and assisting them in making informed choices when selecting production principles and practices to enhance economic and environmental sustainability. Cornell offers research and education programming focused on assessing existing and new production and management practices and techniques with special emphasis on both business vitality and agricultural environmental management. As part of our strategy, we emphasize integration of research and extension to accelerate: identification of problems, focusing scientific effort to resolving problems, field-testing and evaluation of technology and cultural practices, and implementation of environmentally superior innovations/practices for the agricultural, horticultural, and natural resource communities.

As a result of our applied research and cooperative extension efforts, farm businesses, horticulturist, and natural resource managers utilize research-based knowledge to continue producing a stable, safe and affordable food, feed, fiber, and fuel supplies and robust, attractive horticultural plants in economically and environmentally sustainable ways.

2. Brief description of the target audience

Key audiences served, directly and indirectly, in enhancing agribusiness viability include: established producers; new and young producers, consultants and service providers, input suppliers, cooperative directors and managers, marketing firms, governmental agencies, lenders, and local/state/federal governmental leaders.

3. How was eXtension used?

Cornell Cooperative Extension supports and promotes eXtension communities of practice, the eXtension public site and the professional development offered through eXtension.org. Staff across the state are encouraged to be involved in COPs, and the link to eXtension is promoted on the front page of the Cornell Cooperative Extension public staff site. Currently 365 staff are registered active users of eXtension, 62 of which are faculty members.

Examples of participation in COPs that fall into this plan of work area include:

- Agriculture and Food Law
- All About Blueberries
- Animal Manure Management
- Apples
- Ashtubula Viticulture and Enology Degrees
- Beef Cattle
- Cooperatives
- Corn and Soybean Production
- DaireXNET
- Enhancing Rural Capacity
- eOrganic
- Farm Safety and Health
- Farmbill Education Learning Network
- Forest Farming
- Global Food Security and Hunger
- Grapes
- Greenhouse and Nursery Production
- Horses
- Local and Regional Food Systems
- Niche Meat Processor Assistance Network
- Organic Agriculture
- Pest Management
- Pesticide Environmental Stewardship
- Plant Breeding and Genomics
- Precision Agriculture
- Sheep
- Small and Backyard Flocks
- Women in Ag Learning Network
- Youth Agriculture

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	228788	5262450	54468	1252842

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

Patent Applications Submitted

Year: 2014

Actual: 4

Patents listed

- Compositions and Methods for Enhancing Germination (1)
- Compositions and Methods for Enhancing Germination (2)
- Compositions and Methods for Enhancing Germination (3)
- Compositions and Methods for Enhancing Germination (4)

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	300	359	659

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	(1.1c) # participants documented to have applied knowledge or skills gained to strengthen existing business operations.
2	(1.1d) # participating family-owned agricultural/ horticultural/natural resources businesses that plan for succession, transfer, or sale of their business.
3	(1.1e) # participants reporting improved agricultural/ horticultural business profitability attributed at least in part to program participation.
4	(1.1f) # business owners successfully completing an inter-generational transfer or other desired dispensation of their business attributed at least in part to program participation.
5	(1.3b) # participants who demonstrate knowledge gains related to needs of potential employees and/or availability of qualified employees.
6	(1.3c) # participants documented to have made one or more changes in human resources practices to enhance labor availability or retention
7	1.3d) # producers/ horticultural businesses reporting improved labor availability, performance, and/or retention of higher skilled and more valuable human resource team members attributed at least in part to program participation
8	(1.2c) # participants documented to have adopted innovations in food enterprises including production, allied services, processing, and distribution
9	(1.2d) # participants or producer groups who adopt practices of value-added production through retaining control of their product further in the processing chain, starting their own value added business, or forming alliances.
10	(1.2e) # of new food, horticultural, and agricultural businesses and/or new enterprises within existing businesses reported by program participants and attributed at least in part to program participation.
11	(1.4c) # of producers, horticulture business persons, and/or natural resource managers modifying existing practices and/or adopted new production best practices or technologies to address current issues and improve yield efficiency, consistency and/or quality and/or conservation of resources.
12	(1.4d) # of producers, horticulture business persons, and/or natural resource managers who report improved ability to anticipate and respond to environmental and market variations through alternative production management strategies.
13	(1.4e) # technical assistance providers documented to have incorporated current best management practices in their recommendations.
14	(1.4f) # of producers, horticulture business persons, reporting increased dollar returns per acre or reduced costs per acre.
15	(1.5c) # of producers, horticulture businesses, and/or natural resource managers documented to have assessed potential environmental impacts of their operations and developed and acted on plans to eliminate or minimize those concerns.
16	(1.5d) # of producers, horticulture businesses, and/or natural resource managers documented to have developed and implement nutrient management and/or waste

	management plans or modified existing plans to meet production and environmental goals and meet regulations.
17	1.5e) # of producers, horticulture businesses, and/or natural resource managers documented to meet or exceed current environmental protection standards as a result of participating in relevant educational programs.
18	(1.5f) # resource managers reporting reduced environmental concerns for participating enterprises
19	ON-FARM RESEARCH AND PRACTICE DEMONSTRATE COST-SAVING ALTERNATIVE TO HAND WEEDING PERENNIAL SOW THISTLE IN ONIONS GROWN IN MUCK
20	ANNIE'S PROJECT ENHANCES SKILLS, KNOWLEDGE AND INFLUENCES RISK MANAGEMENT PRACTICES FOR PARTICIPATING WOMEN FARMERS
21	CCE'S MARINE PROGRAM, LONG ISLAND UNIVERSITY AND SUFFOLK COUNTY PARTNERED TO RESTORE THE PECONIC BAY SCALLOP
22	CONSUMER BEHAVIOR AND DEMAND IN NYS FRUIT AND VEGETABLE MARKETS

Outcome #1

1. Outcome Measures

(1.1c) # participants documented to have applied knowledge or skills gained to strengthen existing business operations.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	3951

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
501	New and Improved Food Processing Technologies
604	Marketing and Distribution Practices

Outcome #2

1. Outcome Measures

(1.1d) # participating family-owned agricultural/ horticultural/natural resources businesses that plan for succession, transfer, or sale of their business.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	159

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices

Outcome #3

1. Outcome Measures

(1.1e) # participants reporting improved agricultural/ horticultural business profitability attributed at least in part to program participation.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	2506

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices

Outcome #4

1. Outcome Measures

(1.1f) # business owners successfully completing an inter-generational transfer or other desired dispensation of their business attributed at least in part to program participation.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	29

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices

Outcome #5

1. Outcome Measures

(1.3b) # participants who demonstrate knowledge gains related to needs of potential employees and/or availability of qualified employees.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
------	--------

2014

97

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
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
206	Basic Plant Biology
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
304	Animal Genome
305	Animal Physiological Processes
307	Animal Management Systems
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices
610	Domestic Policy Analysis

Outcome #6

1. Outcome Measures

(1.3c) # participants documented to have made one or more changes in human resources practices to enhance labor availability or retention

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	69

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices

Outcome #7

1. Outcome Measures

1.3d) # producers/ horticultural businesses reporting improved labor availability, performance, and/or retention of higher skilled and more valuable human resource team members attributed at least in part to program participation

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
------	--------

2014

67

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices

Outcome #8

1. Outcome Measures

(1.2c) # participants documented to have adopted innovations in food enterprises including production, allied services, processing, and distribution

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	395

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
---------	----------------

501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices

Outcome #9

1. Outcome Measures

(1.2d) # participants or producer groups who adopt practices of value-added production through retaining control of their product further in the processing chain, starting their own value added business, or forming alliances.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	296

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices

Outcome #10

1. Outcome Measures

(1.2e) # of new food, horticultural, and agricultural businesses and/or new enterprises within existing businesses reported by program participants and attributed at least in part to program participation.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	437

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices

Outcome #11

1. Outcome Measures

(1.4c) # of producers, horticulture business persons, and/or natural resource managers modifying existing practices and/or adopted new production best practices or technologies to address current issues and improve yield efficiency, consistency and/or quality and/or conservation of resources.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	16147

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
204	Plant Product Quality and Utility (Preharvest)
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
307	Animal Management Systems
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products

604 Marketing and Distribution Practices

Outcome #12

1. Outcome Measures

(1.4d) # of producers, horticulture business persons, and/or natural resource managers who report improved ability to anticipate and respond to environmental and market variations through alternative production management strategies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	3420

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
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #13

1. Outcome Measures

(1.4e) # technical assistance providers documented to have incorporated current best management practices in their recommendations.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	850

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #14

1. Outcome Measures

(1.4f) # of producers, horticulture business persons, reporting increased dollar returns per acre or reduced costs per acre.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	7445

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
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
206	Basic Plant Biology
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
304	Animal Genome
305	Animal Physiological Processes
307	Animal Management Systems
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products

604 Marketing and Distribution Practices
610 Domestic Policy Analysis

Outcome #15

1. Outcome Measures

(1.5c) # of producers, horticulture businesses, and/or natural resource managers documented to have assessed potential environmental impacts of their operations and developed and acted on plans to eliminate or minimize those concerns.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	555

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
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
206	Basic Plant Biology
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants

215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
304	Animal Genome
305	Animal Physiological Processes
307	Animal Management Systems
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices
610	Domestic Policy Analysis

Outcome #16

1. Outcome Measures

(1.5d) # of producers, horticulture businesses, and/or natural resource managers documented to have developed and implement nutrient management and/or waste management plans or modified existing plans to meet production and environmental goals and meet regulations.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	145

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
----------------	-----------------------

307 Animal Management Systems

Outcome #17

1. Outcome Measures

1.5e) # of producers, horticulture businesses, and/or natural resource managers documented to meet or exceed current environmental protection standards as a result of participating in relevant educational programs.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	209

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

Outcome #18

1. Outcome Measures

(1.5f) # resource managers reporting reduced environmental concerns for participating enterprises

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	71

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

Outcome #19

1. Outcome Measures

ON-FARM RESEARCH AND PRACTICE DEMONSTRATE COST-SAVING ALTERNATIVE TO HAND WEEDING PERENNIAL SOW THISTLE IN ONIONS GROWN IN MUCK

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
------	--------

2014

0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Perennial sow thistle has emerged as a devastating weed problem in certain muck land areas where onions are grown in New York, especially in the Elba area of Western NY where 500 acres are already severely infested. Perennial sow thistle aggressively competes with the onion crop and when not controlled, losses to yield and bulb size can be severe, to the extent that the crop is not worth harvesting. There are already reports of perennial sow thistle infestations in muck pockets in Oswego and Linwood; approximately 10,500 acres of onion-growing muck land is at risk for perennial sow thistle in New York alone. Onions are the third most important vegetable crop grown in New York with an average value of \$55 million. A management strategy to effectively control perennial sow thistle during the growing season within an onion crop was urgently needed.

What has been done

The Cornell Cooperative Extension Vegetable Program's Onion Specialist, Christy Hoepting and Program Aid, Elizabeth Buck focused their efforts on the herbicide Stinger, because of its known activity against this weed. The active ingredient in Stinger is a systemic growth regulator type of herbicide that has the ability to move downward into the perennial sow thistle plant and kill its rhizomes, destroying its abilities to regenerate and persist over winter. In 2013 and 2014, the Vegetable Program conducted four extensive on-farm field studies that determined the optimal use of Stinger in order to achieve the highest weed control while providing the lowest risk of injury to the onion crop. To ensure Stinger could be labeled on onions, they worked closely with the privately owned company that manufactures and sells Stinger, and with IR-4, which is a federally funded program that provides pest management tools to specialty crop growers by developing research data to support new product uses.

Results

This research identified the stage of perennial sow thistle that is the most susceptible to the herbicide Stinger and the stages when Stinger is not a productive treatment option. Research results identified the mid- to late-rosette stage of perennial sow thistle to be the most susceptible stage, with earlier and older stages more challenging to control with Stinger. The best time to apply Stinger was when the onions had between four and six leaves, which resulted in more than 95% marketable bulbs. The team requested that Stinger be labeled on onions in the way that it proved most effective and safe in their research studies. With the support of the manufacturer, the request was accepted. As a result of this on farm study, New York onion growers who face severe infestation with perennial Sow thistle will have options other than costly hand weeding or having to divert valuable muck land out of onion production. There is an estimated \$110,000 in savings in hand weeding expenses per year for every 500 acres of severely infested muck land.

4. Associated Knowledge Areas

KA Code	Knowledge Area
213	Weeds Affecting Plants

Outcome #20

1. Outcome Measures

ANNIE'S PROJECT ENHANCES SKILLS, KNOWLEDGE AND INFLUENCES RISK MANAGEMENT PRACTICES FOR PARTICIPATING WOMEN FARMERS

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In New York State (NYS) the primary occupation for women in farming increased 4.4% from 2007 to 2012 (USDA 2012 Ag Census), while women as principal farm operators increased 7.8%. This data supports the continuing trend of increased participation by women in farm operations, farm ownership, and decision-making roles. With that responsibility, comes the need to improve knowledge and understanding of overall farm operations. Since its inception, Annie's Project was designed to empower women in farming by delivering comprehensive agricultural risk management education in a comfortable environment.

What has been done

Cornell Cooperative Extension facilitates Annie's Project in New York and offers a 6-week program in risk management, farm business planning, marketing, facilities and production insurance, human resources, and labor relations and more. This year the project was expanded to 13 CCE associations, through 15 farm business management educators, and 144 women in farming.

Results

144 Annie's project participants completed the full six-week course (AP Level I), meeting one day per week, four hours per day that included a valuable network building lunch period. CCE facilitators/educators will be able to host future Annie's Project programs on their own to meet demand as needed. As an example of effectiveness, in Broome County 100% of the participants reported an increase in knowledge in all the risk management areas. All the women also reported they would now be running more regular financial analyses of their farm operations and would be addresses human risk concerns (this included: implementing a living will, estate plan, and/or

consulting with an attorney for legal or health care power of attorney for their farm partner). They all set goals for their farms and felt that the ways in which the class was run and information was presented gave the most welcoming environment to learn the information being presented.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
211	Insects, Mites, and Other Arthropods Affecting Plants
213	Weeds Affecting Plants
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices

Outcome #21

1. Outcome Measures

CCE'S MARINE PROGRAM, LONG ISLAND UNIVERSITY AND SUFFOLK COUNTY PARTNERED TO RESTORE THE PECONIC BAY SCALLOP

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Between 1985 and 1995 a series of harmful algal blooms (brown tides) killed most of the bay scallops in the Peconic Estuary, an estuary of national significance. The fishery was worth an average of \$4 million annually between 1966 and 1984 and was part of our local heritage on the East End of Long Island. Commercial inshore fishers depended on the season, from November through March to make it through the winter; recreational harvesters made it a rite of fall. After the collapse of the fishery a few attempts were made at restoration, but none were large enough to have an effect.

What has been done

Since 2005, with \$3.5 million in funding from the Water Quality Protection and Restoration Program of Suffolk County, CCE-Suffolk partnered with Professor Stephen Tettelbach of Long Island University to create the largest bay scallop spawner sanctuary in the world. The Southold Project of Aquaculture Training Program for oyster gardeners and students from LIU and Stony Brook University assisted in many ways. A purpose-built vessel was acquired and a crew assembled to stock and maintain 17 submerged longlines of 200 meters each with a capacity of 200 five-tier lantern nets per line for a maximum of 3,400 nets, each holding 175 bay scallops at spawning size.

Results

CCE Suffolk County used the combined knowledge of shellfish biology and the hatchery (started in 1991) to spawn and stock out six million seed scallops in the program's 10 years. The spawn of these hatchery-reared scallops resulted in a significant increase in the fishery production amounting to an average value of \$500,000 a season in recent years. The data collected and analyzed has resulted in a number of presentations and publications in peer-reviewed journals.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals

Outcome #22

1. Outcome Measures

CONSUMER BEHAVIOR AND DEMAND IN NYS FRUIT AND VEGETABLE MARKETS

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agricultural, food, and wine markets are affected by changes in nutrition and health information, food labeling practices, and promotional efforts. Stakeholders (e.g., growers, restaurant owners, researchers) benefit from understanding the drivers of demand in their industries as well as how consumers respond to different types of information and marketing strategies.

What has been done

This research benefits producers across the state particularly wine producers as they further develop their marketing efforts in the eastern United States. In the fruit sector, this project investigated consumer demand for varietal apple introductions, with the goal of informing the development of effective marketing strategies. Ag and food systems education accounts for 27% of CCE programming. Marketing of local foods is a priority area. Research updates for this topic were shared at regional and county Extension venues like Business, Enology and Viticulture , Brewery and Cidery Startup Workshop , trainings on Developing Your Farm Marketing Plan , Hosting Farm to Table Events , and Local Foods Trails where marketing local foods is of great interest to agricultural audiences.

Results

Experiments in the wine sector showed that customers respond to specific types of marketing information and not others, giving wine producers the capacity to increase sales and demand of wine produced in the eastern U.S. Rickard also demonstrated how cooperation between wineries and local restaurants could be mutually beneficial. His work on varietal introductions in the apple sector provided apple growers in New York State with valuable market research on preliminary consumer demand, which was a head start for developing an effective promotional campaign to launch their new varieties. As a result of this research selected stakeholders have adjusted their production systems and seen increased profits.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices

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

Agricultural/horticultural/natural resources enterprises operate in a complex and volatile context involving susceptibility to weather extremes, changing governmental policies and regulations, competitive land uses and shifting development patterns, evolving consumer demands, and globally influenced markets. During the last couple of years highly damaging flood events damaged crop and forest resources in highly productive areas of New York.

Recovery is slow for many areas.

Fundamental change is occurring in the state and regional economies within which agricultural/horticultural/natural resources enterprises operate. The specific implications of these external factors vary greatly by locale and across commodities and business forms in some cases creating new market opportunities and in others erosion of traditional markets. Population and land use changes in farming communities has led in some places to producer/neighbor issues that influence choice of production practices. Economic stress exacerbates issues of food insecurity and hunger and many community organizations are over- burdened and unable to meet demands.

There is a growing interest by consumers, communities and producers to market local foods locally. This interest continues to influence programs, research and funding availability. These trends are expected to continue.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluation Capacity Building: Cornell Cooperative Extension has worked with the Cornell Office of Research and Evaluation (CORE) to strengthen evaluation practice and build evaluation capacity. CORE has developed a Protocol for evaluation that takes a systems approach, recognizing that individual programs and their evaluations are part of larger program portfolios and are shaped by needs and context at multiple levels of the Extension system. CORE has tested and refined this Protocol in partnership with CCE programs since 2006. A key step in the Protocol is to develop program models, in both familiar columnar form as logic models and in a visual form called pathway models. These models form have helped focus evaluation efforts in Extension programs.

Beginning in 2013 and through 2014, CORE and CCE partnered to initiate program modeling and evaluation planning at the level of the statewide Plans of Work. This effort contributed to the review of near and midterm program outcomes and to the review and planning of several evaluation projects currently underway.

The Protocol has been integrated into professional development in CCE, to promote consistent approaches to evaluation of county-based, regional, and statewide programs.

Regional/Statewide documentation examples. Many of our regional and statewide programs are receiving federal capacity funds. Documentation of outcomes is a requirement of funding. Results shape future program efforts and impact program design. **An example evaluation practice can be found in the section below.**

There is also a requirement for our local and regional programs to report on statewide outcomes/indicators: Program documentation results are aggregated in a statewide accountability database that includes both qualitative and quantitative data for reporting and helping us to better understand impacts.

Key Items of Evaluation

Example - from the CCE Cornell Vegetable Program - use of case studies

SUSTAINABLE PEST MANAGEMENT SAVES MONEY FOR HIGH TUNNEL WINTER GREENS PRODUCTION

Many NY vegetable growers are looking for ways to extend their season and provide fresh, locally grown produce to winter CSAs and winter farmers markets. High tunnels are proving to be an excellent way to produce 'off-season' greens crops with little-to-no fossil fuel based heat, contributing to environmental sustainability. These production systems also contribute to economic and social sustainability by creating year-round income and maintaining customer relations during the traditional off-season. For example NYS has now over 180 winter farmers market, with greens from hoop houses given credit in a recent USDA report for this success.

Pest infestations, such as aphids and cabbage worms, restrict the economic potential of these systems. As a grower in south west NY put it "Pest management is so much more important in the winter because your losses are so much more".

This project promoted early fall releases of parasitoids, combined with late fall and winter applications of biorational pesticides, specifically *Beauveria bassiana*, a commercialized fungal pathogen of aphids. This project conducted 11 on-farm meetings, 7 formal educational seminars, and 3 professional development events with combined attendance of 516 people. Project staff made over 100 farm visits, published 6 newsletter articles, Tweeted regularly and developed an aphid management fact sheet.

The project team evaluated adoption and impact on farms contacted through the project.

Case-study farms were recruited in late summer from across New York State. Growers' experience with winter greens ranged from 0-10 years. Twenty-eight farms initiated case-study work with the team project. Some farms dropped out for reasons such as unexpected changes in production schedule and crop failures. Over the 4 years, there were 24 different successful case studies on 20 farms in 11 counties across New York State. Twenty-four winter greens high tunnel growers adopted biological or biorational control methods to manage pests with an average increase in revenue of \$2465.13. One survey indicated 61% of increased revenue was attributable to increased awareness and skills in natural pest management.

http://cvp.cce.cornell.edu/greenhouse_tunnels.php