2014 University of Vermont Combined Research and Extension Annual Report of Accomplishments and Results

Status: New
Not Yet Submitted

I. Report Overview

1. Executive Summary

At the University of Vermont, Cooperative Extension is a standalone unit led by a Dean and Director that reports to the Provost. The Agricultural Experiment Station is housed in the College of Agriculture and Life Sciences with the Dean of the college also being Director of the Agricultural Experiment Station. The two Deans meet regularly to discuss programming and to maintain a collaborative and cooperative approach to addressing the applied research and outreach needs of agriculture across Vermont. As in many higher education institutions, budgetary constraints continue to grow and impact on the variety and extent of our individual and combined work. The two units work hard to focus and manage limited budgetary resources on identified programmatic needs within their priority areas; strive to have administrative oversight that aligns planning, reporting, evaluation and funding to ensure our units are meeting identified programmatic needs within our priority areas; and encourage collaboration as an effective way to link expertise on campus with stakeholders in the State.

As is the case each year, the research and outreach results described in this report are but a short list of the ongoing work each day that impacts people, families, communities, farms and our overall health and welfare as a result of the efforts of the University of Vermont Cooperative Extension and Agricultural Experiment Station. From the development of new local community leaders, to 4-H STEM programming engaging youth, to studying and assisting farmers with adapting to climate change, to working with local food business and entrepreneurs to address food safety in dairy, meat and vegetable products, to becoming Master Gardener volunteers that address local food access issues and contribute to community, to enhanced grazing techniques to reduce water quality issues, all the research and outreach of UVM contributes to the strength of our state economy and communities.

Through the planned program efforts of the VT-AES and Extension, our work is integrated to best serve our citizens. Multidisciplinary work and integration of our research and outreach fall within and across our planned programs. As a result of this and due to the size of our overall programs in Vermont, it is most practical to report the bulk of our efforts within the NIFA Global Food priority area. Since we do not necessarily have programs of sufficient size to divide neatly into other priority areas, we have chosen to report our efforts within Global Food even if some part of the work could be legitimately allocated to other NIFA priorities. Our efforts are to help grow and maintain a viable market for local and regional food producers and processors for vegetables, meat, and manufactured food products such as artisanal cheeses. These efforts span work from safe production, to safe storage, to safe processing and distribution. The work can range from developing and applying good agricultural practices, to research on the rapid detection of food borne pathogens, to developing new opportunities for artisanal cheese makers or working to understand disease resistance in dairy cattle. The Global Food program area encompasses a wide variety of work conducted at UVM.

Some specific UVM Extension efforts include documenting over 200 recommended practices that protect air, water and soil on Vermont farms following educational efforts. The outcomes included doubling of cover cropping in 5 counties over previous years, no-till farming practices have increased on almost 4000 acres of farmland formerly conventionally cultivated, use of aeration tillage for manure incorporation

occurred on over 1000 acres. UVM Extension is focused on enhancing the efforts of farms to minimize water and nutrient loss from their operations. UVM Extension is also engaged with college faculty to address agricultural business sustainability. Over the past year there were over 800 documented practices implemented that improve or protect business sustainability. These range from diversification, incorporation of new cash crops, and better returns back to the farms. An on-line survey to individuals that participated in a multi-organizational project offering education, technical assistance, coaching and mentoring on farming practices found that 42 individuals were helped and started new businesses. A very high level respondents credited the program with increasing skill levels, confidence levels and decision making ability. Incorporating evaluation into all of our UVM Extension programs has allowed us to increase the data available to show the extent and types of impacts that are occurring across Vermont. The narratives and numbers that follow in the detailed report highlight our success in using better outcomes to measure our impact on targeted populations.

Apples have long vied for second place behind maple production in Vermont. More recently there has been a 50% increase in hard cider sales. VTAES provides science-based research to help growers and cidermakers respond to the overwhelming demand. Research studies all angles from fruit to bottle to understand costs, opportunities for efficiencies, management strategies and economic impact of cider production. Federal-state grants, cash and in-kind matching funds and donations from cider companies pave the way for Vermont to lead the nation in cidermaking and apple research.

Mitigation of the current and future impacts of climate change continues be a priority for VT-AES research. Plant responses to the environment are mediated by gene expression and research is currently focusing on grasses, which comprise 70% of all food crops including rice, cereals and corn, to determine the genetic basis for adaptation to specific climates. Understanding the genomic-level responses to temperature will provide a basis for determining the genetics that underlie plant responses to climate change.

The Dairy Center for Excellence was launched in 2009 with the idea that much of applied research could be done on Vermont farms with the UVM farm dedicated to specialized, intensive research on small groups of animals. Since that time, the number of research partner farms has grown from 4 to 19. Following a start-up investment of $200,000, this has yielded more than $1 million in extramurally funded research that benefits Vermont farms and the agricultural economy. Research projects include identifying genetic traits for milk production, genetic markers for mastitis resistance, alteration of milk lipid composition through feeding, and comparing the efficacy of forage crops with the goal of improving cattle health and optimizing feed costs.

Vermont is not just focusing on agricultural production - we also concentrate on training human capital. Central to our mission in addition to agriculture are public service, civic engagement and furthering economic development, as well as human health. Efforts continue to evolve to address issues of importance to Vermonters as each year passes and new problems arise. Faculty and staff hires and grant funds support existing, new and expanding research and outreach efforts in these areas. For example, 4-H programming continues to be strong in Vermont, reaching nearly 10% of all youth in the state in areas as diverse as traditional 4-H clubs, to teens teaching others younger students about energy, to learning how to be an environmental steward and the political process, to robotics and other STEM activities. Other examples include Prosper, a prevention program being introduced into schools in Vermont to help address drug and alcohol abuse by working with youth, parents and schools simultaneously and the urban and community forestry program that has trained over 400 tree stewards and over 100 forest pest detectors across communities in Vermont. This program also engaged with over 20 community based schools to have over 700 students to learn about their urban forests and encroaching insect and disease threats to these forests.

The narratives and outcomes listed in the detailed plan again show the breadth of work from Global Foods,

Personal and Intellectual Development of Youth and Adults. The work is wide ranging, following the needs of the communities and stakeholders in conjunction with the expertise of faculty and staff of the Agricultural Experiment Station and UVM Extension. The fundamental story is that of a small land grant university, with limited funds, trying to meet the demand for research and outreach from our stakeholders. It requires some focus, some diversity of interest and the use of the national land grant system to provide our stakeholders with the range of expertise and education that addresses some of their needs. The continued diminution of budgets is a serious impediment to continued service to the residents of the state over time.
Follow this link to see a copy of our Annual Report 2014.
https://www.uvm.edu/extension/about/?Page=annualreport.php

Total Actual Amount of professional FTEs/SYs for this State

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	53.0	0.0	12.4	0.0
Actual	56.9	0.0	12.2	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- External University Panel
- Expert Peer Review

2. Brief Explanation

Extension key staff have monthly telephone meetings with the four states that cooperated to develop an on-line planning and reporting system. These are an opportunity to get feedback on programs and statewide goals and initiatives. Discussions include regional programs, opportunities for multistate work, sharing staff resources and other programming strategies and issues. In addition, staff at the faculty and administrative level access the on-line system (Imprs.net) to view peers work. Program staff, faculty and administration are active in regional and national discussions around program success and challenges. VT-AES provides the opportunity for seed project funding through a competitive proposal process. Project proposals are evaluated for scientific and technical merit through a peer review process. Projects are intended as seed funding to aid the PI in establishing a new research direction, or augment dimensions of their currently, extramurally funded research program.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of the general public
- Other (see narrative for details)

Brief explanation.

Many projects have a committee of advisors who provide input on the current needs. This input helps in determining the direction of program efforts including delivery method, outreach and content. Most events ask participants of programs if the programming meet their needs and expectations. Post event evaluations are standard practice for UVM Extension and provides an opportunity to gather further input informing future program effort.
A state advisory board meets with the Director and key staff. They meet with program staff to hear more about new program efforts as well as established projects and the impact they are having. The Board serves in an advisory capacity directly to the Dean. The members represent a broad perspective with diverse experience and backgrounds.
Partnerships with communities, public and private organizations and businesses are important in reaching and serving clients with appropriate programming. These relationships remain a critical part of identifying needs and gaps for programming.
The Director of VTAES has an advisory board which meets twice a year to provide feedback and advice. They provide advice on future trends of agriculture and life sciences.
The Dean/Director of Extension and Dean of the College of Agriculture and Life Sciences, Director of VTAES meet regularly and share stakeholder input relevant to their work.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Needs Assessments
- Use Surveys

Brief explanation.

UVM Extension creates new and continues to develop existing relationships with organizations and agencies in an effort to create relationships which enable meaningful conversations. In a small state relationships are critical in accessing key individuals with knowledge of current relevant issues for Vermonters. UVM Extension is located in 11 of 14 counties and provides educational programs in all 14 counties. Vermont's small communities and high level of citizen involvement create opportunities to connect with Vermonters to understand who is in their communities Program participants are engaged in developing future programs through on-site data collection feedback tools.
VTAES Director looks at a wide range of expertise and appoints individuals in the advisory committee who have experience in the area of dairy farming, state legislation, scientists, finance, marketing, to name a few.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals

- Survey of the general public
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief explanation.

Extension works with focus groups, state advisor groups, post event and reflective data collection methods.
Individuals on the VTAES advisory board meet twice a year and provide information on future trends of agriculture and life sciences.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief explanation.

As a small state we know our citizens. Collected data is used to refine, remove or create new educational programs and delivery methods that will serve the needs of the state. UVM Extension has close relationships with state and local government, an asset when seeking input and when sharing expertise and/or concerns of citizens.
VTAES advisory board provides a source of council to the Director, using their input to help formulate a research direction.

Brief Explanation of what you learned from your Stakeholders

Increase support for local food systems research and extension.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1879928	0	1876820	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	1874417	0	1931003	0
Actual Matching	3151988	0	2115315	0
Actual All Other	6007947	0	0	0
Total Actual Expended	11034352	0	4046318	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	0	0	0	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Global Food Security and Hunger
2	Community Development and the Personal and Intellectual Development of Youth and Adults
3	Climate Change
4	Sustainable Energy
5	Childhood Obesity
6	Food Safety
7	Urban Non Point Source Pollution

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	4%		0%	
133	Pollution Prevention and Mitigation	30%		0%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		10%	
205	Plant Management Systems	5%		16%	
206	Basic Plant Biology	0%		7%	
211	Insects, Mites, and Other Arthropods Affecting Plants	0%		9%	
216	Integrated Pest Management Systems	6%		4%	
302	Nutrient Utilization in Animals	0%		10%	
308	Improved Animal Products (Before Harvest)	0%		12%	
311	Animal Diseases	0%		3%	
315	Animal Welfare/Well-Being and Protection	0%		2%	
402	Engineering Systems and Equipment	4%		0%	
601	Economics of Agricultural Production and Farm Management	33%		16%	
602	Business Management, Finance, and Taxation	9%		0%	
604	Marketing and Distribution Practices	3%		0%	
605	Natural Resource and Environmental Economics	3%		0%	
610	Domestic Policy Analysis	0%		2%	
723	Hazards to Human Health and Safety	3%		0%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%		4%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	28.0	0.0	4.1	0.0
Actual Paid	5.3	0.0	6.8	0.0
Actual Volunteer	7.4	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
1102696	0	1139623	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1854275	0	1020847	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
3534399	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Project listed in bold followed by delivery methods:

- **Beginning Farmer Initiative**. Focus groups, learning circles, workshops, mini-courses and publications
- **Ag Business Management.** Conferences, courses, consultations and farm visits.
- **Agricultural safety**. Courses, consultations and farm visits
- **Community Preparedness.** Workshops, discussion group
- **Equine program.** Annual equine event, publications, workshops.
- **Farm and Forest Transfers.** Workshops, consultations, farm visits
- **Farm Viability.** Farm visits, consultations
- **Farming Alternatives**. Workshops, consultations, farm visits.
- **Farming Across Cultures**: Farm Visits, consultations
- **Forage and Pasture Management Education.** Conference, farm visits, consultations
- **Maple Program.** Conference, workshops, newsletter.
- **Nutrient Management Program**. Farm visits, consultations
- **Organic Grain Project**. Demonstrations, data gathering.
- **Pest Management Education.** IPM and Pesticide Education and Safety Program (PESP) training.
- **Horticulture for Private/Commercial Landowner and Industry Professional Education**: Tour and conference
- **UVM Tax School.** conference, tax book
- **Vegetable and Berry Growers**. Consultations, farm visits, meetings, various media, presentations, website.
- **Vermont New Farmer Network**. Conference, networking, consultations
- **Vermont Pasture Network.** Pasture walks, demonstrations and trials, conference, consultations,

various media.

- **Vermont Tourism and Recreation.** Research, conference.
- **Extension Master Gardener.** Course, train the trainer
- **Women's Agricultural Network.** Newsletters, website, classes, workshops, individual and small group consultations.
- **GAP**: Consultations, workshops
- **Engineering for Food Production, Harvest and Storage consultation, mass media, fact sheet, research, class/course**

AES efforts.

- **Animal Manure Treatment Systems**
- **Storm and Wastewater Management Systems**
- **Perturbation of soil ecosystems by anthropomorphic interventions**
- **Soil nutrient effect on forest ecosystem productivity and lake water quality**
- **Soil fertility/chemistry/physical problems associated with waste disposal and bioremod faction**
- **Economics of organic dairy, crop management and alternative energy**
- **Heifer nutrition, rearing and management**
- **Dairy nutritional immunology**
- **Small ruminant production and management systems**
- **Development of strategies to address applied equine issues**
- **Biofuels from coconuts and other energy sources**

- **Surveillance and prevention of spread of Asian Longhorned Beetle**
- **Management of thrips pests in forests and greenhouses**
- **Identification/control of fungal propagation**
- **Fungal biological plant protection, collection and management**
- **Explore microbial pesticides and fungal components as IPM strategies**
- **Innate immunity, DNA-based vaccines and mastitis prevention**
- **Hormonal regulation of glucose synthesis and milk production**
- **Functional genomics and photoperiod effects on hormonal cycles/milk production**
- **Explore ruminant lipid metabolism**
- **Impact of global climate**

- **Identification challenges of the national health care reform for the farmer population.**
- **Studying alternative systems of maple crop management**
- **Animal management production**
- **Food Systems to contribute to increasing access to healthy food for all Vermonters**
- **Resources to improve production methods for apple growers.**
- **Environmentally friendly crop production systems**

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2. Brief description of the target audience

- 4-H: Camp Counselors
- Adults
- Agriculture/Natural Resources: Watershed Based Organizations
- Agriculture: CCA & Crop Consultants
- Agriculture: Crop Producers
- Agriculture: Dairy Producers
- Agriculture: Equine Producers/Owners
- Agriculture: Farm Employees

- Agriculture: Farm Families
- Agriculture: Farm Managers
- Agriculture: Farmers
- Agriculture: Goat & Sheep Producers
- Agriculture: Greenhouse Ornamental Growers
- Agriculture: Home Gardeners
- Agriculture: Industry Professionals
- Agriculture: Livestock producers
- Agriculture: Maple Industry
- Agriculture: Maple Sugar Producers
- Agriculture: Non-Dairy Producers
- Agriculture: Nursery operators
- Agriculture: Ornamentals Industry Professionals
- Agriculture: Service Providers
- Agriculture: Small Fruit & Vegetable Growers
- Agriculture: Veterinarians
- Agriculture:Dairy Goat, Meat Goat and Dairy Sheep Producers

- Agriculture: Organic agencies
- Policymakers

3. How was eXtension used?

Certified organic dairy agriculture has been the fastest growing sector of the organic market, yet there is an information gap among educators and other agriculture service producers regarding certified organic production systems.
Therefore, with funding from a USDA NIFA Organic Research and Extension Initiative grant, UVM Extension agronomist Heather Darby and staffer Deb Heleba led a national team of organic dairy experts in the development of an online course to help Extension educators and others agriculture service providers better understand certified organic dairy farming. "An Introduction to Organic Dairy Production" is a self-directed course housed on eXtension's online campus site. It is composed of ten modules on topics ranging from certification standards and pasture management to milk quality and herd health. Each module combines readings, narrated lessons, optional homework exercises and recommended resources, and end-of-module quizzes. The peer-reviewed course has also been checked for compliance with National Organic Program regulations to ensure high quality, accurate organic information.
During the 2012 fall semester, the course was piloted among a group of 57 undergraduate students at the California State University--Chico. Students took the course either entirely online, or online with supplemental, in-person instruction. An end-of-course survey revealed that all students gained knowledge on all topics covered through the course. One student said, "The information is solid. Being that I am headed back to my dairy, I will certainly use the knowledge I gained from this course." Another said, "Having this knowledge will really give me a "one-up" on a lot of other people in the industry, as the organic side of things is becoming more prevalent in farming." The course is now available to the public for a modest fee with the option to earn continuing education units. Since the beginning of 2014, 9 professionals across the U.S. have enrolled. Our goal is for UVM Continuing Education to offer this class for credit. It would be one of the only Organic Dairy Curriculums in the country.

Website: eXtension-Horses (www.extension.org/horses) "eXtension-Horses: Keeping Equestrians Educated" The longterm efforts to create and present peer-reviewed, research based information to extension clientele through the national eXtension platform has received international recognition.

Women in Agriculture Learning Networks
CoP: Entrepreneurs and Their Communities

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	27965	446000	600	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	3	15	18

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Class/course

Year	Actual
2014	25

Output #2

Output Measure

- Conference

Year	Actual
2014	8

Output #3

Output Measure

- Consultation

Year	Actual
2014	2694

Output #4

Output Measure

- Consumer Publication

Year	Actual
2014	6

Output #5

Output Measure

- Demonstration

Year	Actual
2014	51

Output #6

Output Measure

- Discussion group

Year	Actual
2014	65

Output #7

Output Measure

- Educational/evaluation instrument

Year	Actual
2014	4

Output #8

Output Measure

- Electronic Communication/phone

Year	Actual
2014	1609

Output #9

Output Measure

- Field day/fair

Year	Actual
2014	3

Output #10

Output Measure

- Field site visit

Year	Actual
2014	43

Output #11

Output Measure

- Funding request

Year	Actual
2014	36

Output #12

Output Measure

- Presentation

Year	Actual
2014	178

Output #13

Output Measure

- Publication - Peer Reviewed

Year	Actual
2014	5

Output #14

Output Measure

- Publication - curriculum

Year	Actual
2014	2

Output #15

Output Measure

- Publication - fact sheet

Year	Actual
2014	64

Output #16

Output Measure

- Publication - magazine article

Year	Actual
2014	20

Output #17

Output Measure

- Publication - manual

Year	Actual
2014	6

Output #18

Output Measure

- Publication - newsletter

Year	Actual
2014	40

Output #19

Output Measure

- Publication - newsprint article

Year	Actual
2014	110

Output #20

Output Measure

- Research project

Year	Actual
2014	73

Output #21

Output Measure

- TV segment/ATF

Year	Actual
2014	25

Output #22

Output Measure

- Technical Publication

Year	Actual
2014	33

Output #23

Output Measure

- Tour(s)

Year	Actual
2014	4

Output #24

Output Measure

- Train the Trainer trainings

Year	Actual
2014	106

Output #25

Output Measure

- Website development and updates

Year	Actual
2014	134

Output #26

Output Measure

- Workshop - series

Year	Actual
2014	9

Output #27

Output Measure

- Workshop - single session

Year	Actual
2014	127

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	number of farmers that develop a nutrient management plan protecting water and soil
2	number of Master Gardener participants earning certification
3	number of farmers who implement best field management practices(s) crop/pasture, product, and/or soil productivity while protecting water, air and/or soil
4	Number of individuals who implement IPM practice(s) increasing the protection of water, air and/or soil
5	Number of individuals and business owners who implement recommended practice(s)that accomplish owner values and goals to improve/protect business sustainability
6	The number of individuals who complete a plan including preventative measures to secure animal health, food safety and public health protecting the food chain and market integrity
7	The number of growers who adopt new crop/plant variety(ies) resulting in maintaining or increasing sales
8	number of individuals who complete a business plan, start a business (within 18 months of planning) based on personal values, goals and business viability
9	number of participants who make an intentional, informed decision regarding starting a business based on feasibility, personal goals and values
10	Number passing the USDA GAPs audit to gain or maintain a market for their locally grown crop(s)
11	The number of growers growing organic crops increase revenues improving business sustainability
12	The number of producers who implement produce safety/food safety plans/practices to gain or maintain a market for their locally grown crop(s)
13	number of farmers who implement key element(s) of their nutrient management plan protecting water and soil
14	number of individuals who assess vulnerabilities and implement a practice to secure animal health, food safety, and/or public health protecting the food chain and market integrity
15	Number of individuals who implement recommended gardening practice(s) protecting water, air, and/or soil
16	Number of challenges that health care providers face as they seek to meet the needs of Vermont's migrant dairy workers.
17	Number of genetic factors that may independently or jointly contribute to insecticide resistance of beetle populations.

18	Number of research results which increase the understanding of a plants response to their environment.
19	Number of sustainable disease and arthropod pest management strategies for organic apple growers using less toxic pesticides.

Outcome #1

1. Outcome Measures

number of farmers that develop a nutrient management plan protecting water and soil

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	23

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Water quality is in the forefront of the Vermont Governor's agenda. Although farmers are actively working to address their contribution to the water quality problem there is more that needs to be done. Nutrient Management Planning (NMP) assists farmers to plan steps that minimize nutrient and soil losses to protect Vermont's water. UVM Extension assists farmers in completing their NMPs.

What has been done
In 2006, a course for livestock farmers was developed. The course has been taught for the past 9 years. The course has been upgraded with a companion user-friendly web-based application to assist farmers to keep accurate and complete records. This is important to effectively implement their NMP they develop.

Results
Since 2009, 180 farmers, representing 10% of all dairy farms in Vermont have completed NMPs. The companion application is available on an iPhone or iPad allowing for inputs of manure and fertilizer and yields on the go. Based on a 2010 survey of Vermont farmers, they have reduced phosphorus additions on their farms by 50% as a result of implementing NMP dairy their farms. This not only protects the environment but also saves input dollars spent,strengthening the viability of these farms.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

number of Master Gardener participants earning certification

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	110

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
205	Plant Management Systems
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

number of farmers who implement best field management practices(s) crop/pasture, product, and/or soil productivity while protecting water, air and/or soil

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	232

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A high crop yield on every acre is essential to economic sustainability for Vermont farms. To do this without causing environmental degradation, it is necessary to manage the soils to improve quality and provide the plants with adequate nutrients without over application of phosphorus or nitrogen. Extension works with partners to create management practices that enhance healthy farm soils while protecting the environment.

What has been done
Extension conducted on-farm research and demonstrations on crop rotations, cover crops, soil amendments, reduced tillage, and soil aeration. Education was offered on these topics as well as nutrient management planning, pasture management, soil testing, irrigation and drainage, etc. In addition no-till drill equipment was acquired and made available to farms and help was provided in retrofitting farmers own planters.

Results
Last year UVM Extension staff documented the implementation of 232 recommended practices that protect air, water and soil on Vermont farms. Many positive impacts have resulted. After implementing these practices cover cropping acreage doubled in 5 counties in just one year. No-till farming has increased by almost 4,000 acres just in 2014. In another region of the state 62 farmers planted cover crops on 4,536 acres and completed aeration tillage for manure incorporation on 1,225 acres. This latest science and programming helps farmers understand the effects of these and other practices and supports them in their efforts to protect the environment while keeping a strong agriculture based business. The state benefits by having a healthier environment and strong agricultural economy and working landscape, high priorities in Vermont.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
205	Plant Management Systems
216	Integrated Pest Management Systems
402	Engineering Systems and Equipment

601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation

Outcome #4

1. Outcome Measures

Number of individuals who implement IPM practice(s) increasing the protection of water, air and/or soil

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	315

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
205	Plant Management Systems
216	Integrated Pest Management Systems

Outcome #5

1. Outcome Measures

Number of individuals and business owners who implement recommended practice(s)that accomplish owner values and goals to improve/protect business sustainability

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	879

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Vermont's 7000+ farms' sales total $673 million (USDA Ag Census). Just the dairy industry adds $2.2 billion to Vermont's economy (Vt Dairy Promotion Council). Farming is a multifaceted and complicated business. Factors like keeping up with and applying new research and changing technology, aging farmers and a limited workforce, and environmental impact issues are just a few of the challenges. Extension is a non-regulatory, unbiased source for farmers to access the latest research for best recommended practices and information.

What has been done
Extension programs are accessible in multiple formats and topics ranging from one-on-one to national webinars. Topics are strongly influenced by stakeholders input. Last year UVM Extension agricultural programs completed 2,694 consultations, 51 demonstrations, 56 research projects, over 2200 mass media, social media and other publications, etc. Topics ranged from financial records and goal setting, agri-tourism, to cold storage for vegetable crops.

Results
Evaluation documented the implementation of 879 recommended practices that improve or protect business sustainability. Diversification is important to many Vermont farms. One Extension effort developed a locally based grain growing and processing system. This enhanced the capacity for farmers to produce high quality and yielding grains to meet the growing demand for this high value crop. Programming included research results from hundreds of varieties, outreach and market development. Farmers adopted at least one, but average three recommended practices and reported an average additional income of $7000 per grain grower, $35,000 for millers, and $5-20,000 for bakers and distributors. Extension and its partners continue to support and strengthen the agriculture industry with its 30 plus projects across Vermont.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
205	Plant Management Systems
216	Integrated Pest Management Systems

402	Engineering Systems and Equipment
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
723	Hazards to Human Health and Safety

Outcome #6

1. Outcome Measures

The number of individuals who complete a plan including preventative measures to secure animal health, food safety and public health protecting the food chain and market integrity

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

Outcome #7

1. Outcome Measures

The number of growers who adopt new crop/plant variety(ies) resulting in maintaining or increasing sales

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	173

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Home gardeners want hardy, less resource-intensive plants. They are looking for new varieties that perform well, and greenhouse and nursery growers want to meet this demand. Appropriate choice of varieties results in more sustainable landscapes and less need for fertilizers and pesticides reducing the environmental impacts, expenses for home gardeners and increases sales for growers, contributing more than $25,562,000 to Vermont's economy according to the 2012 Census for Agriculture.

What has been done
UVM Extension, in collaboration with other partners, conducts at least two bus tours annually for home gardeners. These sold out tours visit gardens and provide at least four hours of education through presentations and videos on new plants, design tips, production and products, and best practices for environmentally-friendly gardening practices. The participants are surveyed at the end of the tour to measure if they are taking new useful information, and if they attended a previous tour, they are asked if they acted on previous learning.

Results
These tours have provided education to over 500 home gardeners and industry professionals over the past 5 years. Of the 92% responding this year, 46% had been on a previous tour in the past year. 72% had grown new varieties spending on average $386 each. Most had reduced pesticide usage, changed other practices or were organic. This data is consistent with previous tours and results. Impacts include increased sales for the Vermont nursery industry, reduced loss of plants for home gardeners, as well as significantly reducing negative impacts on the environment by protecting pollinators and other beneficial insects by reducing pesticide use, or selecting pest and climate resistant plants. Responses also indicated gardeners were not sure if they were using native plants indicating future education needs in this area.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
205	Plant Management Systems
216	Integrated Pest Management Systems
604	Marketing and Distribution Practices

Outcome #8

1. Outcome Measures

number of individuals who complete a business plan, start a business (within 18 months of planning) based on personal values, goals and business viability

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	42

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Beginning farmers (< 10 years in operation) are a growing part of Vermont's agricultural economy. New farmers provide direct access to local food through farmers markets, CSAs and farmstands, and are increasingly servicing wholesale and institutional markets. Vermont?s new farms now comprise about 28% of the total number, and have an aggregated market value of about $129 million, or about 16% of Vermont?s agricultural economy. Start-up farms typically are small in terms of market value, but the future of the working landscape depends on them.

What has been done
Funded by a USDA grant, the Vermont New Farmer Network (VNFN) is a multi-organization project offering education, technical assistance, coaching and mentoring for beginning farmers. The project?s goal is to increase the number of profitable small and medium-sized farms. Farmers obtained assistance in multiple topic areas and in multiple formats, accessing classes, workshops, webinars and individual coaching. The most common topic areas were: business and financial management and planning, crop and livestock production techniques, and marketing.

Results
Of the 287 people who responded to an online survey by June 2014, 42 reported that the education and technical assistance they received helped them start a new business. One

hundred percent of respondents said that project increased their knowledge and decision-making ability; 97% reported it increased skill level; and 95 % said it increased their confidence. One participant explained, "Having this planning and analysis so early in our farming career will significantly help us to create a sustainable business model.?

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation

Outcome #9

1. Outcome Measures

number of participants who make an intentional, informed decision regarding starting a business based on feasibility, personal goals and values

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	10

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

Outcome #10

1. Outcome Measures

Number passing the USDA GAPs audit to gain or maintain a market for their locally grown crop(s)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	19

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 #11

1. Outcome Measures

The number of growers growing organic crops increase revenues improving business sustainability

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	25

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

Outcome #12

1. Outcome Measures

The number of producers who implement produce safety/food safety plans/practices to gain or maintain a market for their locally grown crop(s)

Not Reporting on this Outcome Measure

Outcome #13

1. Outcome Measures

number of farmers who implement key element(s) of their nutrient management plan protecting water and soil

Not Reporting on this Outcome Measure

Outcome #14

1. Outcome Measures

number of individuals who assess vulnerabilities and implement a practice to secure animal health, food safety, and/or public health protecting the food chain and market integrity

Not Reporting on this Outcome Measure

Outcome #15

1. Outcome Measures

Number of individuals who implement recommended gardening practice(s) protecting water, air, and/or soil

Not Reporting on this Outcome Measure

Outcome #16

1. Outcome Measures

Number of challenges that health care providers face as they seek to meet the needs of Vermont's migrant dairy workers.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In the past ten years Hispanic workers have arrived in Vermont and have become a significant portion of the Vermont dairy labor force. In 2007 the Vermont Department of Health studied the health status and found a number of problems; primary care for childhood was inconsistent, for some there were no vaccinations, workers were not screened for tuberculosis, limited dental care, skin problems, and pain and injuries related to work.

What has been done
During 2014 results from migrant workers self reported health issues were compared with health clinic intake data. A statewide public opinion poll tracking changes in public perceptions of migrant farm workers was completed. The researcher participated in a study committee on farm worker housing and assisted with a preliminary assessment of farmworker housing standards.

Results
The result of the studies and poll indicated that fear of immigration, law enforcement, proximity to resources, outreach to farmers, public opinion(s), supported environments, and policy development were some of the barriers that prevented migrant workers to seek health care.

4. Associated Knowledge Areas

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

Outcome #17

1. Outcome Measures

Number of genetic factors that may independently or jointly contribute to insecticide resistance of beetle populations.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Potato Growers will be the ultimate beneficiaries of this research. It will help growers understand how beetles continue to resist insecticides so rapidly.

What has been done
Researcher tested genetic variation due to demographics, genetic diversity due to evolution, demographics history to determine if beetle populations are identical by descent.

Results
Genetic diversity does not differ between regions, genetic diversity does not differ among populations within regions. This information is essential to researchers as it begins to understand how the beetles continue to evolve resistance to all major insecticides.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants

Outcome #18

1. Outcome Measures

Number of research results which increase the understanding of a plants response to their environment.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Plants are rooted to one spot their entire life. In order to survive, plants must sense even the smallest environmental change and respond rapidly, changing their physiology and modifying further development. Understanding the rapid molecular changes that underlie plant's responses to the environment can help optimize conditions or treatments that maximize plant yields under stressful conditions. Alfalfa and soybeans are important food crops for animals and humans because they store protein in their seeds and nitrogen in their roots. Understanding the development of these crops can help with crop production.

What has been done
The project looked at the effect of different salt treatments on plant roots. Plants were grown and inoculated in growth pouches which allowed the scientist to access and visualize root development.

Results
Evidence shows that a plants roots exchange molecular signals with soil bacteria to trigger legume to form nodules, which the bacteria then infects. Plant roots are sensitive to salt stress. Increased temperature, due to changes in overall climate, can lead to periodic stress, which results in accumulation of salts in the soil as water evaporates.

4. Associated Knowledge Areas

KA Code	Knowledge Area
206	Basic Plant Biology

Outcome #19

1. Outcome Measures

Number of sustainable disease and arthropod pest management strategies for organic apple growers using less toxic pesticides.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Apple production in Vermont generates about 10 million dollars from about 3,000 acres of orchards and represents a significant component of the state's diversified agricultural industry. There has been a significant interest in growing organic apples in the state yet growers face challenges limiting adoption of organic production. Managing arthropod pests and diseases is one of the main challenges facing Vermont organic growers.

What has been done
Evaluated and compared disease and arthropod pest damage on three apple cultivars using three organic orchard management systems. The three systems used were the Standard Organic Management system use of copper, sulfur, lime sulfur and organic insecticides; Standard Organic Management with Reduced sulfur/lime sulfur system, and Holistic organic management system - use of agricultural biostimulants with no copper or sulfur products.

Results
Scientist found differences among cultivars and organic management systems in horticultural vigor, yield, fruit quality and arthropod pest incidence and damage. Out of the cultivars that were examined, 'Enterprise', 'Liberty', 'Redfree', and 'Goldrush' were the best cultivars for organic management.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Participants from past year's NMP courses were surveyed as to changes implemented as a result of taking the course. Sixty percent of the farms increased yields while decreasing phosphorus fertilizer by 50% and nitrogen fertilizer by 25%. 100% of respondents felt they had a positive impact on water quality.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Community Development and the Personal and Intellectual Development of Youth and Adults

☑ 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
124	Urban Forestry	11%		0%	
608	Community Resource Planning and Development	15%		0%	
802	Human Development and Family Well-Being	15%		0%	
805	Community Institutions and Social Services	5%		0%	
806	Youth Development	54%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	22.0	0.0	0.0	0.0
Actual Paid	5.5	0.0	0.0	0.0
Actual Volunteer	12.6	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**
653382	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1098717	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
2094244	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•4-H Positive Youth Development Program: Help youth acquire Life Skills in the following areas: Decision Making; Critical Thinking; Problem-Solving; Communication; Goal-Setting; and Skills for Everyday Living to succeed as adults. Delivery Methods: 6-8 sequential learning hours using experiential learning techniques for in- school, afterschool, or out-of-school settings

•Operation Military Kids (OMK) exists to educate Vermont communities on the unique experiences and challenges of military life and its impact on families, while providing positive opportunities for youth. Ready, Set, Go! Operation: Military Kids Vermont OMK-VT aims to establish community partnerships that will connect and educate people by: Creating community support, delivering opportunities to youth and families, supporting military kids, collaborating with community partners, educating the public, including the education community, and incorporating military families into existing community resources.

•S.E.T. Activities: 4-H SET will begin to show how science and engineering issues affect youths' lives and prepare a future generation of scientists and engineers. The 4-H SET program will present 4-H with a new opportunity to connect to the LGU's SET research community and integrate with current youth workforce development initiatives.

•Market Analysis, Needs Assessment and Strategic Planning: This program provides the community with analytical techniques that can be put to work immediately in economic revitalization efforts. The process requires input from local residents so that recommendations reflect both market conditions as well as the preferences of the community. Delivery Methods: Group meetings and discussion groups in community.

•Community Leadership: Assessing, addressing and expanding community capacity through leadership and public policy education efforts including building--and education members and clientele of--coalitions and collaboratives.

•Coping with Separation and Divorce (COPE): Parent education for parents of minor children who have filed for separation, divorce, dissolving of a civil union, parentage, changes in rights and responsibilities concerning their children. This is a court mandated program.

•Migrant Education Recruitment Program (MEP): To ensure that children of migrant farm workers, and qualifying youth under age 22, are aware of the educational support services available to them. Delivery Methods: Outreach to schools, agricultural employers, and social service agencies throughout the state.

•Vermont AgrAbility Project: To make recommendations that can be used by farmers with disabilities to maintain employment, through development of accommodations. Delivery Methods: Process involves recruitment of eligible individuals through referrals. Intake information is recorded on farms provided by the National AgrAbility Project. Site visits are the primary means of contact.

•Take Charge (TC/RC): Helping community adult members to gain the skills necesary to be confident enough to take part in town government by ultimately competing for town government leadership positions. Delivery Methods: Meetings, discussion groups.

•Vermont Urban and Community Forestry program :A joint initiative between the University of Vermont Extension and the Department of Forests, Parks and Recreation. The mission of the program is to promote the stewardship of the urban and rural landscapes to enhance the quality of life in Vermont

communities. The program provides educational, technical and financial assistance in the management of trees and forests, in and around the built landscape as well as First Detector education for invasive pests. Delivery Methods: Classes, meetings, various media, community volunteer projects.

•Foster, Adoptive and Kin Care Partnership: Enhance outcomes for children in foster, adoptive and kin care homes. Delivery Methods: Curriculum and workshop series

PROSPER:[**PRO**moting **S**chool-community-university**P**artnerships to **E**nhance **R**esilience]: PROSPER is a delivery system of evidence-based programs for the purpose of improved Child and Family Outcomes such as long-term reductions in substance use; reduced youth behavior problems; and long-term effects on school engagement and academic success, with similar benefits occurring for both low- and high-risk groups.

2. Brief description of the target audience

- 4-H: Adult Volunteers
- 4-H: Youth
- 4-H: Youth Volunteers
- Agriculture: Dairy Producers
- Agriculture: Farmers
- Agriculture: Farmers w/disabilities
- Agriculture: Industry Professionals
- Agriculture: Migrant workers
- Agriculture: Service Providers
- Agriculture: Small Fruit & Vegetable Growers
- Agriculture:Government Agency Personnel
- Communities: Community Action Agencies
- Communities: Educators
- Communities: Local Officials/Leaders
- Communities: Non-Governmental Organizations
- Communities: Schools
- Community: Family Court personnel
- Environmental Professionals: Environmental Managers
- Extension: Faculty/Staff
- Forestry: Government Agency Personnel
- Forestry: Landscape Industry
- Forestry: Trained First Detectors
- Forestry: Wood Products Industry Organizations
- Forestry: Woodland Managers/Foresters
- Forestry: Woodland Owners
- Public: Adult Caregivers
- Public: Adults
- Public: College Students
- Public: Daycare Providers
- Public: Families
- Public: General
- Public: Health Providers
- Public: Kinship and Foster Parents
- Public: Military families

- Public: Military youth
- Public: Nonprofit Organizations
- Public: Parents
- Public: Small Business Owners/Entrepreneurs
- Public: Volunteers
- Public: VT SOUL Tree Stewards
- Public: Youth
- School Grade: K-12

3. How was eXtension used?

Enhancing Rural Capacity CoP participation

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	10512	69000	9375	1800

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	1	0	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- 4-H Afterschool
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- 4-H Club

Year	Actual
2014	240

Output #3

Output Measure

- 4-H Day Camp

Year	Actual
2014	5

Output #4

Output Measure

- 4-H Overnight camp

Year	Actual
2014	6

Output #5

Output Measure

- 4-H School enrichment

  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- 4-H Short-term/special interest

Year	Actual
2014	134

Output #7

Output Measure

- Class/course

  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- Conference

Year	Actual
2014	5

Output #9

Output Measure

- Consultations

Year	Actual
2014	1300

Output #10

Output Measure

- Discussion group

Year	Actual
2014	188

Output #11

Output Measure

- Field site visit

Year	Actual
2014	89

Output #12

Output Measure

- Funding request

  Not reporting on this Output for this Annual Report

Output #13

Output Measure

- Presentations

Year	Actual
2014	28

Output #14

Output Measure

- Publication - fact sheet

Year	Actual
2014	4

Output #15

Output Measure

- Publication - newsletter

Year	Actual
2014	102

Output #16

Output Measure

- Publication - newsprint article

Year	Actual
2014	10

Output #17

Output Measure

- Radio Spots/program (educational
  Not reporting on this Output for this Annual Report

Output #18

Output Measure

- TV segment/ATF

Year	Actual
2014	11

Output #19

Output Measure

- Train the Trainer sessions
  Not reporting on this Output for this Annual Report

Output #20

Output Measure

- Web Page
  Not reporting on this Output for this Annual Report

Output #21

Output Measure

- Workshop - series

Year	Actual

2014	2

Output #22

Output Measure

- Workshop - single session

Year	Actual
2014	166

Output #23

Output Measure

- Trainee delivered programming

Year	Actual
2014	102

Output #24

Output Measure

- Electronic Communication/phone
  Not reporting on this Output for this Annual Report

Output #25

Output Measure

- Web updating/social media releases

Year	Actual
2014	296

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	increase in number of farmers with disabilities maintaining employment
2	Number of Migrant Education eligible students enrolled
3	Increase the number of program participants serving as leaders on Committees
4	Number of individuals (youth and volunteers) increasing knowledge and/or skills in content and careers (across subject areas ranging from animal science to environmental science to technology)
5	Number of individuals who use leadership and decision making skills in executing their role and responsibilities effectively developing and/or implementing policy
6	Increase the number of parents understanding family transition through parentage, divorce or separation who understand the impact of these changes on their children.
7	Number of farmers with disabilities maintaining employment
8	increase in number of youth reached with positive youth development programming demonstrate mastery for targeted life skills, including: Decision making; wise use of resources; communication; accepting differences; leadership; useful/marketable skills; healthy lifestyle choices; and/or self-responsibility
9	Number of volunteers and staff demonstrating new techniques/activities in clubs and programs learned through 4-H training and developmemnt
10	the number of published policy changes addressing best practices in child welfare.
11	Number of individuals who use skills and effectively participate in addressing community issue(s) (e.g. green infrastructure, local leadership, hunger, volunteerism, etc.)
12	Number of participants who are English language learners will increase their level of English proficiency
13	Number of participants who report improvements in children's self-regulation and attachment related behaviors
14	number of individuals who assess vulnerabilities and implement a practice to secure animal health, food safety, and/or public health protecting the food chain and market integrity
15	The number of communities or community group/organization(s) establishing or expanding projects to improve or mitigate a community issue

Outcome #1

1. Outcome Measures

increase in number of farmers with disabilities maintaining employment

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Number of Migrant Education eligible students enrolled

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	182

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions and Social Services
806	Youth Development

Outcome #3

1. Outcome Measures

Increase the number of program participants serving as leaders on Committees

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Non-profits are critical to meet community needs but can be vulnerable due to federal and state funding. Good leadership and local community support can help ride out these challenges. Caledonia, Essex, and Orleans counties comprise Vermont?s poorest area of the state where between 13.8% and 15.6% of people live below poverty level, compared to a state-wide average of 11.6%. (U.S. Census Bureau) The Northeast Kingdom Community Action Agency (NEKCA) is a non-profit organization serving these three counties.

What has been done
UVM Extension worked with NEKCA's leadership team to develop and implement a multi-year plan raising awareness of the effects of poverty and their role in the community. The second year of implementation, deep cuts in federal and state funding threatened critical basic services. Leveraging relationships formed in the previous year, NEKCA began an aggressive fundraising campaign and an advocacy role with both federal and state leaders to highlight the impact that funding cuts were having in the Northeast Kingdom.

Results
A skilled leadership team has created a stronger organization, resulting in less interruption of critical services for families. The future is more promising. In 2014 the number of families who received fuel assistance decreased by 47.7% but almost 7000 families, a (46% increase), received emergency food; almost 200 families (29.6% increase) got emergency rent assistance; and almost 6400 families got rides (a 20.4% increase) from 2013. In addition, due to an increased understanding of the effects of poverty, community leaders, businesses and community members are supporting an organization dedicated to meeting the needs of some of the most vulnerable members of the community.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
805	Community Institutions and Social Services

Outcome #4

1. Outcome Measures

Number of individuals (youth and volunteers) increasing knowledge and/or skills in content and careers (across subject areas ranging from animal science to environmental science to technology)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	3527

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #5

1. Outcome Measures

Number of individuals who use leadership and decision making skills in executing their role and responsibilities effectively developing and/or implementing policy

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	42

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Foot-and-mouth disease (FMD) is a highly contagious disease affecting cattle, pigs, and small ruminants and it has severe socio-economic consequences. The U.S. food animal industry has changed significantly in size, structure, efficiency and extent of movement since the last U.S. outbreak of FMD in 1929. The closely-coupled network structure of modern animal agriculture increases the chance that an outbreak in the United States would be catastrophic.

What has been done
The National Institute for Animal Agriculture coordinated the symposium, ?Fostering a New Preparedness Paradigm: Facilitating a Conversation Among Public and Private Sector Stakeholders?, to enhance preparedness for FMD across food animal production sectors. It brought together industry stakeholders representing the entire supply chain as well as regulatory agency stakeholders, academicians and policymakers. Participants were surveyed immediately following the symposium and one year later to see what was done.

Results
Responses indicated that 42 of 45 attendees had implemented one or more actions that will aid in FMD preparedness. Attendees represented: producers or producer organizations, trade media and industry public relations staff, veterinarians, regulatory personnel, diagnosticians and government personnel. Susceptible food animal production directly generates over $140 billion per year nationally and close to $600 million per year in Vermont. These communication, planning and training activities are necessary to support an effective response to keep out foot-and-mouth disease or keep it from spreading to protect animal health and well-being as well as the economic vitality of rural communities in Vermont and across the country.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #6

1. Outcome Measures

Increase the number of parents understanding family transition through parentage, divorce or separation who understand the impact of these changes on their children.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1751

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #7

1. Outcome Measures

Number of farmers with disabilities maintaining employment

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	103

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
805	Community Institutions and Social Services

Outcome #8

1. Outcome Measures

increase in number of youth reached with positive youth development programming demonstrate mastery for targeted life skills, including: Decision making; wise use of resources; communication; accepting differences; leadership; useful/marketable skills; healthy lifestyle choices; and/or self-responsibility

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	937

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Vermont?s natural resources serve as a foundation of our state?s economy and one that we want to ensure and sustain for generations. Preparing Vermont?s children to protect this valuable legacy is challenged by the fact that many of our youth have a limited understanding of our natural environment. A study of energy literacy in middle and high school students showed very low levels of energy literacy supporting the need for curriculum in schools for this area.

What has been done
With the help of funding from the State Farm Youth Advisory Board the Teens Reaching Youth (TRY) for the Environment program was created. A partnership between the Vermont Energy Education Program and UVM Ext. 4-H Teen & Leadership Program trained 41 teens and 11 adult mentors to teach elementary school students to be energy engineers. The curricula consists of three 1-hour lessons related to each solar energy and wind energy. To date, 373 Vermont students have completed the wind & solar lessons with more classes in process and to begin.

Results
Results of the program were impressive. The learning concepts were evaluated and showed a high level of understanding (the top 4 concepts scoring 95 & 96%) by the young students. The teen teachers also gained much from this experience in the area of life skill development. They identified gains in problem solving, leadership, stress management, teamwork, planning, organization, self-responsibility, goal setting, critical thinking, cooperation, communication, and conflict resolution. TRY for the Environment has allowed teens to take action on an issue that is important to them, and their actions will help to make sure that Vermont has an educated citizenry on energy issues. UVM Extension 4-H program reached 8751 youth with this and other programming last year, documenting increased STEM knowledge for 3527 youth.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #9

1. Outcome Measures

Number of volunteers and staff demonstrating new techniques/activities in clubs and programs learned through 4-H training and developmemnt

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual

2014	92

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #10

1. Outcome Measures

the number of published policy changes addressing best practices in child welfare.

Not Reporting on this Outcome Measure

Outcome #11

1. Outcome Measures

Number of individuals who use skills and effectively participate in addressing community issue(s) (e.g. green infrastructure, local leadership, hunger, volunteerism, etc.)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	243

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Urban and Community Forestry (UCF) program trains interested community members as tree stewards and forest pest first detectors. Most Vermont municipalities have small budgets for tree

management so volunteer community members are often the impetus for moving local urban forestry efforts forward to address invasive pests and other community forest concerns. The survival of over 100 million ash trees in Vermont is threatened by the Emerald Ash Borer (EAB). Vermont will have to deal with a large number of hazardous trees and loss of tree canopy within a short time. One community estimates it will cost almost $500,000 to remove and replace their ash trees.

What has been done
The UCF Program trained 450 Tree Stewards and 147 Forest Pest First Detectors, developed planning and policy templates, inventory protocols, education and outreach materials and is providing financial and technical assistance. One project, funded by a grant from the USDA Forest Service, moved to assist twenty priority communities. UCF also focused on partnerships with higher education institutions supporting 8 UVM interns and engaging with over 720 students to complete projects in over 20 Vermont communities.

Results
These planning efforts are patiently and passionately being spearheaded by our network of hundreds of dedicated Tree Stewards and First Detectors. One of these volunteers, who has been involved in one communities EAB planning, provided the following advice to other communities, ?EAB is scary and the planning process is not going to go fast, but you have to be patient and chip away at it. It will only be more and more important in the future.? Urban forests provide economic, environmental and social benefits to communities. It is important to care for and plan for urban forests to mitigate potential negative effects on communities. Having a force of hundreds of active, trained community volunteers enables us to do this.

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
608	Community Resource Planning and Development

Outcome #12

1. Outcome Measures

Number of participants who are English language learners will increase their level of English proficiency

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	91

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
805	Community Institutions and Social Services
806	Youth Development

Outcome #13

1. Outcome Measures

Number of participants who report improvements in children's self-regulation and attachment related behaviors

Not Reporting on this Outcome Measure

Outcome #14

1. Outcome Measures

number of individuals who assess vulnerabilities and implement a practice to secure animal health, food safety, and/or public health protecting the food chain and market integrity

Not Reporting on this Outcome Measure

Outcome #15

1. Outcome Measures

The number of communities or community group/organization(s) establishing or expanding projects to improve or mitigate a community issue

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	82

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
608	Community Resource Planning and Development
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

A 4-H STEM program was created with the help of funding from the State Farm Youth Advisory Board the Teens Reaching Youth (TRY) for the Environment program was created. This innovative partnership between the Vermont Energy Education Program and UVM Extension 4-H Teen & Leadership Program trained 41 teens and 11 adult mentors to teach elementary school students to be energy engineers. The curricula consists of three 1-hour lessons related to solar energy and three 1-hour lessons related to wind energy.
Nine of our 12 TRY Teams have completed their commitment of teaching the program to

two different groups of K-3 students; some teams taught three programs. To date, 373 Vermont students have received the wind & solar lessons, with another 33 having received all of the solar lessons and the first wind lesson. Two TRY Teams are set to complete their second program this summer and we anticipate another 30 students reached.
Results of the program were impressive. The learning concepts were evaluated and showed a high level of understanding by the young students:
96% understood that all materials do not block light.
95% understood that a maple tree will block more light in the summer.
80% understood that a structure casts a bigger shadow in the afternoon.
96% understood that wind can push objects.
95% understood that humans can design things that use wind to work.
78% understood that wind will always be available.
The teen teachers also gained much from this experience in the area of life skill development. They identified gains in problem solving, leadership, stress management, teamwork, planning, organization, self-responsibility, goal setting, critical thinking, cooperation, communication, and conflict resolution.

UVM Extension implemented PROSPER (PROmoting School-community-university Partnerships to Enhance Resilience), a model developed by the expertise of prevention scientists, public school systems, and educators from the Cooperative Extension System (CES) at Penn State and Iowa State to communities in Vermont that disseminates and sustains high-quality evidence-based interventions (EBI's) for the prevention of youth substance use and problem behavior. PROSPER Teams, composed of community stakeholders, cooperate to deliver evidence-based programs to a critical mass of families and youth in a targeted age group to bring about positive community-wide change. Two PROSPER sites were identified: Lyndon Town School in Caledonia County and Camels Hump Middle School in Chittenden County.
Both teams met their recruitment rate targets, reaching 10% or more of the 6th grade families per session, both with 100% graduation rates. Using a reflective pre/post survey, 87% of parents say that they are now more likely to handle problems after they've cooled down and 83% of parents are now more clear with consequences for breaking rules and for following through with those consequences. 76% of youth participants indicate that they now know one step to take towards reaching their goals. This preliminary data is promising and indicative of the results we will see after completion of the 7th grade in school program.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Climate Change

☑ 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	0%		22%	
104	Protect Soil from Harmful Effects of Natural Elements	0%		3%	
112	Watershed Protection and Management	0%		3%	
123	Management and Sustainability of Forest Resources	0%		30%	
125	Agroforestry	0%		12%	
131	Alternative Uses of Land	0%		6%	
132	Weather and Climate	16%		1%	
133	Pollution Prevention and Mitigation	52%		14%	
205	Plant Management Systems	0%		1%	
601	Economics of Agricultural Production and Farm Management	15%		6%	
602	Business Management, Finance, and Taxation	17%		0%	
801	Individual and Family Resource Management	0%		1%	
903	Communication, Education, and Information Delivery	0%		1%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	3.4	0.0
Actual Paid	0.6	0.0	1.9	0.0
Actual Volunteer	0.2	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**
44930	0	319821	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
75553	0	317078	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
144011	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Invasive Pests - Monitoring of the Asian Long Horned Beetle & Hemlock Woolly Adelgid; interception and prevention if possible, mitigation through work with bioactive fungi and natural enemy species; work with the US forest service, US-ARS, and the maple industry.

Forest Education: Work with landowners and next generations to deal with forest fragmentation and management and usage.

Maple Production - research and extension efforts at the Proctor Maple Center are directed at extending the sugaring season, maximizing yield, and minimizing disease to trees.

Monitoring of the Eastern Forests - Species change and demarcation levels are being observed, documented and modeled for northern forests through remote sensing and on-the-ground observations.

Invasive Plants - research will continue on the genetic and physiological basis for "invasiveness" of problem plant species and introductions.

Greenhouse Gas Emissions - research has been initiated to evaluate microbial population dynamics in ruminant farm animals in an effort to control/minimize the production of methane and other greenhouse gases. Parallel efforts are underway to understand soil processes that affect the carbon cycle, and that may sequester carbon in soil sinks.

Climate Change Adaptation - working with farmers on irrigation and drainage to address major storm events and extended wet/dry periods through workshops, newsletters, and research.

Sustainable Transportation Project - working with the transportation industry promoting the use of transportation options that: Reduce greenhouse gas and other harmful emissions, increase energy efficiency, and utilize alternative fuels and new technologies. Education and information are delivered through consultation, social media, on-line courses and certification, and vehicle certification programs.

Research to Identify key genes in crop yields that could predict how plants will react to climate change.

2. Brief description of the target audience

- Agriculture: Farmers
- Agriculture: Produce Growers
- Agriculture: Service Providers
- Agriculture:Government Agency Personnel
- Extension: Faculty/Staff
- Public: Business / Commercial transportation industry
- Agriculture: Maple Producers

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	3000	1700	0	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	6	6

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research projects focusing on climate change management practices on Vermont farms that aid in climate change adaptation.

Year	Actual
2014	3

Output #2

Output Measure

- Number of research projects on invasive plants in Vermont

Year	Actual
2014	2

Output #3

Output Measure

- Consultations

Year	Actual
2014	27

Output #4

Output Measure

- Workshop series

Year	Actual
2014	7

Output #5

Output Measure

- Mass Media: Blog post/Social Media/Web Page/Internet site updating

Year	Actual
2014	2

Output #6

Output Measure

- Publication - Newsletter

Year	Actual
2014	3

Output #7

Output Measure

- Field/demonstration Reseach project/sites

Year	Actual
2014	5

Output #8

Output Measure

- Surveys conducted

Year	Actual
2014	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of identified or mitigated invasive species threat to the environment
2	Number research results published regarding the generation of greenhouse gas emissions from farm animals and through soil processes
3	Number enterprises who implement recommended environmental behaviors to meet or exceed terms to have vehicles certified through the eRating program
4	Number of ecological and evolutionary factors identified that influence invasive grass in Vermont.
5	Number of climate change management practices on Vermont farms that aid in climate change adaptation.

Outcome #1

1. **Outcome Measures**

Number of identified or mitigated invasive species threat to the environment

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Number research results published regarding the generation of greenhouse gas emissions from farm animals and through soil processes

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Number enterprises who implement recommended environmental behaviors to meet or exceed terms to have vehicles certified through the eRating program

2. **Associated Institution Types**

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
More than 25 percent of carbon dioxide (CO2) emissions in the United States can be attributed to transportation activities, with 73 percent of these emissions coming from passenger transportation. In August of 2012, UVM Extension launched the Certification for Sustainable Transportation (CST) Program promoting the use of transportation options that: Reduce greenhouse gas and other harmful emissions, Increase energy efficiency, and Utilize alternative fuels and new technologies.

What has been done

The CST has developed and runs a vehicle based certification and labelling program called the ?eRating? as well as driver certification programs to help drivers reduce and eliminate unnecessary idling and adopt fuel efficient driving practices. Currently the CST is primarily working with privately owned bus and motor coach operators located in 48 states and 3 Canadian provinces. We have had in excess of 2,200 drivers, shop mechanics, and administrative staff go through our ?Eco-Driver? and ?Idle Free? certification program.

Results
Anecdotal evidence from companies report savings of 2-8% on fuel and wear and tear on equipment. We are currently collecting data to quantify these results. To date 25 companies' have completed certification and training with another 20 close to completion. There are 520 vehicles, 420 of which are buses or motor-coaches, which are eRating certified with >3000 to be certified next year. Other results include companies greater use of pro-environmental behaviors such as implementing recycling programs. President and CEO of Coach USA, Coach Canada, and Megabus, in a November 15, 2013 Article of Bus and Motorcoach News Stated: 'He said his company has saved 'hundreds of thousands of dollars per year' since it began participating in the program's pilot phase four years ago. Efforts are continuing to expand to other companies.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
602	Business Management, Finance, and Taxation

Outcome #4

1. Outcome Measures

Number of ecological and evolutionary factors identified that influence invasive grass in Vermont.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Invasive grass species can decrease native species diversity and alter ecosystem processes.

What has been done
Researcher carried out field and greenhouse experiments on both native and invasive species in both native range in Europe and invasive range in North America showing that some invasive populations are very aggressive.

Results
Continued introduction of different variants for horticultural or agronomic plant species can increase the invasive potential of these species and increase the grass ability to spread into new areas. Changes in key traits like C-N content of leaves can result in increased aggressiveness of reed canary grass making it more likely to take over wetlands.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

Outcome #5

1. Outcome Measures

Number of climate change management practices on Vermont farms that aid in climate change adaptation.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Climate change is expected to impact farming through precipitation increases, changes in crop suitability (e.g. apples) and decreases in milk productivity capacity

What has been done
The researcher has sampled greenhouse gases on farms, photo-documented dozen different farms, created five sets of photo simulations illustrating existing conditions

Results
Researcher has interfaced project with a related project to create a list of climate change best practices. The researcher has made connections with several farms and will sample greenhouse gases for the next two years. Researcher has disseminated results at a number of workshops

4. Associated Knowledge Areas

KA Code	Knowledge Area
104	Protect Soil from Harmful Effects of Natural Elements
112	Watershed Protection and Management
125	Agroforestry
132	Weather and Climate

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Sustainable Energy

☑ 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
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		40%	
402	Engineering Systems and Equipment	20%		0%	
601	Economics of Agricultural Production and Farm Management	80%		30%	
605	Natural Resource and Environmental Economics	0%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.5	0.0	0.7	0.0
Actual Paid	0.0	0.0	0.3	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
15830	0	50211	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
26620	0	67090	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
50740	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

On farm Energy Crop Research Projects and renewable energy workshops on plant variety, planting dates, pest control, harvesting and processing of oilseed.

Vermont is a leading state in converting cow manure into electricity. This research is to see if it is economically feasible for farmers.

2. Brief description of the target audience

Agriculture: Crop Producers
Agriculture: Farmers
Scientific Community
Undergraduate students

3. How was eXtension used?

..

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	70	0	0	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	2	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Research Projects

Year	Actual
2014	28

Output #2

Output Measure

- Workshop - single session

Year	Actual
2014	3

Output #3

Output Measure

- Radio

Year	Actual
2014	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of individuals who implement recommended practice(s) beginning energy crop production or increasing yield and/or quality of existing crops contributing to a sustainable, cost effective energy source
2	Number of farmers who implement a new practice to begin production or to improve current oilseed production yield and quality
3	Number of research findings for genes important in the structure of the plant cell wall during growth that will aid in the usage of using cell walls as a source of biofuels.

Outcome #1

1. Outcome Measures

Number of individuals who implement recommended practice(s) beginning energy crop production or increasing yield and/or quality of existing crops contributing to a sustainable, cost effective energy source

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	12

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Oilseed-type sunflower is a relatively new crop for the state of Vermont, with the potential to add value to farms. Unfortunately, bird and insect pests have limited the overall yield potential with seed and oil yields traditionally lower than national averages. Birds have decimated up to 80% of sunflower fields, migrating through and quickly decreasing yields. Insect pests like the Banded Sunflower Moth have proven devastating to seed yields and quality be feeding on the meal inside seeds.

What has been done
To address issues of pest predation, UVM Extension initiated on-farm research trials evaluating sunflower planting dates ranging from mid-May to late June. Later planting dates resulted in higher seed and oil yields and, often, greater test weights, indicating better seed quality. UVM Extension began recommending to some growers that selecting a shorter-season variety and planting in June, as opposed to earlier in the spring, may help to mitigate pest pressures.

Results
Calculated seed yields increased each year despite sometimes challenging weather conditions, from 931 lbs per acre in 2011 to 1296 lbs in 2012, and 1725 lbs in 2013. In addition, the discrepancy between total and harvestable population has lessened since 2011 enabling growers to get a greater percentage of their crop to the seed bin. This 85% increase in average seed yield in Vermont can be attributed in part to UVM Extension's continued work on IPM in sunflower. With the resources to conduct meaningful and applied research and perform outreach to growers, UVM Extension has been able to develop and implement strategies for reducing pest damage. This has increased yields and quality of sunflower, enabling the crop to be considered a viable option for farmers in the region.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Number of farmers who implement a new practice to begin production or to improve current oilseed production yield and quality

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Number of research findings for genes important in the structure of the plant cell wall during growth that will aid in the usage of using cell walls as a source of biofuels.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Plant cell walls represent a renewable source of carbon for the development of biofuels and other plant based energy products. Cell walls are structures whose composition changes in response to changes in the environment. It is important to understand what these changes do to plant cell walls.

What has been done
Experiments have been done to investigate cell wall assembly.

Results
During past year, scientists found that SNARE VTI13 plays a unique role in trafficking pathways essential for cell wall organization.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Government Regulations

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Oilseed producers were surveyed at the annual oilseed producer meeting and online to identify if information generated and delivered by the UVM oilseed program has improved yield and quality of the crop. Results included:
33% indicated that UVM Extension work helped improve their oilseed yields
75% indicated that our work help improve weed control, insects, and disease
100% indicated that our work helped them reduce harvest losses through fine-tuned harvest and drying practices.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Childhood Obesity

☑ 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
604	Marketing and Distribution Practices	4%		0%	
607	Consumer Economics	4%		6%	
609	Economic Theory and Methods	0%		6%	
703	Nutrition Education and Behavior	21%		52%	
704	Nutrition and Hunger in the Population	7%		6%	
724	Healthy Lifestyle	19%		30%	
805	Community Institutions and Social Services	45%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	1.5	0.0
Actual Paid	0.2	0.0	1.4	0.0
Actual Volunteer	0.2	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**
57579	0	121286	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
96823	0	380083	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
184553	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Local Food - working with communities of resettled refugee farmers with limited english language skills and new to the county. Continuing assessment of their needs to meet their goals to boost their food security and develop food-based microenterprises.

Healthy Eating: - Grant support guided effort to work with school service professionals and training programs for Childcare Centers

Senior Farm Share: work with senior housing directors who deliver multi-session nutrition workshop for low-income Senior Farm Share participants to increase their consumption of local, fresh produce by enhancing participant's skills to prepare fresh fruits and vegetables and gain nutritional knowledge based on the Dietary Guidelines. Data is being collected soliciting input on why they participate and what is of the greatest benefit to them.

Puentes/Bridges: work with latino farm workers and farm employers in collaboration with the UVM medical school and nursing students providing needs related to health care access or home health, provide health and nutrition education, and food access - farm visits, phone, consultation.

Farm to Plate: unifies business, government and non-profits to scale up local food production and consumption. Network of more than 160 organizations working to achieve goals to re-localize food production and distribution.

Web-based digital imaging training package; dietary assessment work on USDA National School Lunch Program.

Studies to determine time use patterns for food purchasing, preparation/cleanup, eating/drinking and traveling associated with food consumption.

2. Brief description of the target audience

- Agriculture: Beginning Farmers
- Agriculture: Migrant workers
- Communities: Educators
- Communities: Resettled Refugees
- Community: Health Entities

- Extension: Faculty/Staff
- Public: College Students
- Public: Daycare Providers
- Public: Health Providers
- School nutrition experts
- Researchers
- Policymakers

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	624	30	0	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	3	14	17

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Consultation

Year	Actual
2014	171

Output #2

Output Measure

- Consumer Publication
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Curriculum
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Fact Sheets
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Publication - Newprint

Year	Actual
2014	18

Output #6

Output Measure

- Train the trainer program
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Workshop Series
  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- Workshop - single session

Year	Actual
2014	35

Output #9

Output Measure

- Webpage (new and updated)
  Not reporting on this Output for this Annual Report

Output #10

Output Measure

- Presentation
  Not reporting on this Output for this Annual Report

Output #11

Output Measure

- Class/course session

Year	Actual
2014	45

Output #12

Output Measure

- Evaluation

Year	Actual
2014	7

Output #13

Output Measure

- Research projects

Year	Actual
2014	5

Output #14

Output Measure

- Radio

Year	Actual
2014	7

Output #15

Output Measure

- Television

Year	Actual
2014	1

Output #16

Output Measure

- Research Poster

Year	Actual
2014	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number the individuals who incorporate one or more healthful eating practices and/or physical activity to prevent/manage disease and/or obesity
2	Number of individuals who use food planning and wise shopping behaviors improve diet and the supply of food
3	The number of individuals who select and prepare a variety of produce to help prevent/manage disease and/or obesity
4	Number of methodologies that measure children's fruit and vegetable consumption in the school setting.
5	Number of individuals who take steps to meet daily needs for health, education, social and personal wellbeing
6	Number of proven strategies that encourage exercise in first year college students.

Outcome #1

1. Outcome Measures

Number the individuals who incorporate one or more healthful eating practices and/or physical activity to prevent/manage disease and/or obesity

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Number of individuals who use food planning and wise shopping behaviors improve diet and the supply of food

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	36

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Poor eating habits during childhood, that frequently result in overweight and obesity, are a serious concern across the U.S. Developing healthy eating habits early in life provides the best chance of preventing ongoing and future health problems. Childcare centers provide an excellent opportunity for early dietary intervention. Because childcare providers are the gatekeepers to the nutrition provided within these centers, they are an appropriate target group for relevant education and mentoring.

What has been done
Green Mountain Healthy Kids Challenge (GMHKC) was a grant-funded project with a component designed to expand and enhance training programs for childcare centers enrolled in the federally funded Child and Adult Care Food Program (CACFP). This was done by utilizing three behavior-focused strategies, including: training and technical assistance to enable preparation and distribution of nutritious and appealing meals to children, providing fun and interactive nutrition education, and building community support for creating healthy food environments.

Results

A representative of each childcare center enrolled in the project completed a rubric self-assessment at the beginning (April 2012) and end (April 2013) of their project participation. Pre and post rubrics comparisons found broad categories of change were focused on 1)nutrition standards, 2)the eating environment, 3)nutrition education, 4)physical activity, and 5)communication, promotion and monitoring. The majority of responses were found to have improved, addressing topics such as menu planning, staff modeling of healthy behaviors, food service personnel qualifications and training, physical environments that promote safe play, and promotion of healthy food choices. Providing healthy options in a child.s daily environment support lifelong healthy habits.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
724	Healthy Lifestyle

Outcome #3

1. Outcome Measures

The number of individuals who select and prepare a variety of produce to help prevent/manage disease and/or obesity

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of methodologies that measure children's fruit and vegetable consumption in the school setting.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

USDA National School Lunch Program implemented regulation requiring children to select a fruit or vegetable with their lunch meal. Assessing whether these efforts result in children's increased consumption of fruit or vegetable intake or simply lead to increased waste is vital to evaluate the impact.

What has been done
Research team tested the feasibility, reliability, and validity of methods assessing children's fruit and vegetable consumption.

Results
It was determined that digital imaging (DI) was reliable to assess children's fruit and vegetable consumption during school lunch and DI and O (observation) were valid for assessing mean consumption but less precise for estimating individual consumption.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #5

1. Outcome Measures

Number of individuals who take steps to meet daily needs for health, education, social and personal wellbeing

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	204

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Vermont is experiencing a growing immigrant and refugee population who often has a strong history of growing their own food. Vermont's very different climate, cost of land, this populations ability to communicate outside of their community, knowledge of local crops and other issues are challenges. These challenges can threaten their food access, security and overall well being. Extension programs can bridge some of these barriers.

What has been done
The New American Farmer program began in 2013 with programming continuing in 2014 to help resettled refugees meet their food production and processing needs. A survey was conducted to identify future needs for land and technical assistance. Interpreter and cultural liaison services were provided to improve communication and access to support. Through workshops and discussion group meetings best marketing strategies and niche market opportunities were identified.

Results
As a result of programming >50 growers established productive farming plots demonstrating many best practices, 31 growers stated they saved money by growing their own food and used these savings for other household expenses. One participants said, "we can pick healthy vegetables instead of spending money. We definitely eat healthier..?" In addition to feeling connected to their culture and community, 10 growers obtained markets securing future income in addition to growing their own food. Efforts contributed to the establishment of multiple culturally important crop operations such as rice, spices and medicinals. In addition to improved access to culturally important food, business opportunities for their crop operations, they have brought a part of their culture to the growing local food movement.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
704	Nutrition and Hunger in the Population
724	Healthy Lifestyle

Outcome #6

1. Outcome Measures

Number of proven strategies that encourage exercise in first year college students.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The majority of first year college students do not meet exercise guidelines. Study examines weight change of first year students to determine the use of monetary incentives to help motivate exercise and when discontinued will that exercise remain.

What has been done
117 Students were randomly assigned to control, discontinue incentive, and continued incentive conditions for 12 weeks.

Results
When monetary incentive was discontinued fitness center goal achievement decreased from 63% of goals met to 3% of goals met.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Staffing changes in Extension and grant funding have shifted programming from nutrition education for those with diabetes and some youth programming to working with underserved latino migrant farmers and a growing immigrant and resettled refugee population. Migrant farmers often have challenges with access to health care and food including, importantly, access to familiar foods. The immigrant and resettled refugee farming communities face challenges of food insecurity and access as well with additional need for support for issues that enable them to grow their own food, often an important part of their culture. Some desire to explore options enabling them to begin food enterprises..

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluation Study #1
Poor eating habits during childhood, that frequently result in overweight and obesity, are a serious concern across the U.S. Developing healthy eating habits early in life provides the best chance of preventing ongoing and future health problems. Given the number of young children currently being cared for outside of the home, childcare centers provide an excellent opportunity for early dietary intervention. Because childcare providers are the gatekeepers to the nutrition provided within these centers, they are an appropriate target

group for relevant education and mentoring.

Green Mountain Healthy Kids Challenge (GMHKC) was a grant-funded project with a component designed to expand and enhance training programs for childcare centers that were enrolled in the federally funded Child and Adult Care Food Program (CACFP). This was done by utilizing three behavior-focused strategies, including: training and technical assistance to enable preparation and distribution of nutritious and appealing meals to children, providing fun and interactive nutrition education, and building community support for creating healthy food environments.

A representative of each childcare center that was enrolled in the project was asked to complete a 14-page rubric self-assessment at the beginning (April 2012) and end (April 2013) of their project participation. Pre and post rubrics were compared to identify any statistically significant changes in the responses over time. The broad categories of change were focused on 1) nutrition standards, 2) the eating environment, 3) nutrition education, 4) physical activity, and 5) communication, promotion and monitoring. Pre-post comparisons were done using a statistical approach (Wilcoxon sign ranked test) to identify significant changes over the year. The vast majority of responses were found to have improved in the positive direction, addressing topics such as menu planning, staff modeling of healthy behaviors, food service personnel qualifications and training, physical environments that promote safe play, and promotion of healthy food choices.

Evaluation study #2

Healthy eating and physical activity patterns that are established at an early age are essential for students to achieve their full academic potential. Vermont Nutrition and Fitness Policy guidelines provide schools with the most recent information on best practices. However, many schools participating in the National School Lunch Program need on-going training, technical assistance, mentoring and financial support to effectively convert nutrition and physical activity resources and activities into best practices that improve student food choices and physical activity.

Team Nutrition Training Grant funds were used to provide training and technical assistance to foodservice professionals through:

- multiple workshops on the 2010 Dietary Guidelines;
- a three day institute in June 2012;
- technical assistance provided through year-long mentoring; and
- support from a graduate student of UVM's Masters in Dietetics program for each school program.

Additionally, training to improve nutrition education in the classroom was provided by offering multiple workshops and mentoring for school teams on integrating nutrition education into the curriculum.

School menus (including details on recipes) that depicted one week in May 2012 and one week in May 2013 were provided by the nine participating school teams so that potential changes from one year to the next could be identified. Given current nutrition priorities as defined in the U.S. Dietary Guidelines for Americans, offerings of fruits, vegetables and whole grains were the focus of this analysis. A significant and positive difference in the menu offerings was identified for three of the five categories being assessed. Significant differences were found in whole grains served at breakfast and lunch, as well as vegetables served at lunch.

School teams were also asked in June 2012 and June 2013 to complete a seven-page self-assessment rubric that contained questions designed primarily to determine the extent to which a school believed they were meeting the Healthier U.S. School Challenge guidelines provided by USDA. Schools tended to overestimate how well they were meeting the

Guidelines in the self-assessment completed in 2012, but significant improvement occurred by the second self-assessment in 2013.

Key Items of Evaluation

Evaluation #1

Green Mountain Healthy Kids Challenge (GMHKC) was a grant-funded project with a component designed to expand and enhance training programs for childcare centers that were enrolled in the federally funded Child and Adult Care Food Program (CACFP). The vast majority of responses were found to have improved in the positive direction, addressing topics such as menu planning, staff modeling of healthy behaviors, food service personnel qualifications and training, physical environments that promote safe play, and promotion of healthy food choices.

Evaluation #2

Team Nutrition Training Grant funds were used to provide training and technical assistance to foodservice professionals. School menus (including details on recipes) that depicted one week in May 2012 and one week in May 2013 were provided by the nine participating school teams so that potential changes from one year to the next could be identified.

A significant and positive difference in the menu offerings was identified for three of the five categories being assessed. Significant differences were found in whole grains served at breakfast and lunch, as well as vegetables served at lunch.

School teams were also asked in June 2012 and June 2013 to complete a seven-page self-assessment rubric that contained questions designed primarily to determine the extent to which a school believed they were meeting the Healthier U.S. School Challenge guidelines provided by USDA. Schools tended to overestimate how well they were meeting the Guidelines in the self-assessment completed in 2012, but significant improvement occurred by the second self-assessment in 2013.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Food Safety

☑ 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
311	Animal Diseases	0%		30%	
604	Marketing and Distribution Practices	0%		6%	
607	Consumer Economics	0%		6%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%		15%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%		35%	
722	Zoonotic Diseases and Parasites Affecting Humans	0%		8%	
	Total	0%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	2.0	0.0
Actual Paid	0.0	0.0	1.6	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	300062	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	330217	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

Extension efforts for this area are captured at this time in the Global Food planned program with programming on food safety targeted to those who wish to maintain a viable market for locally grown food, food growers and processors. Efforts focus on working with small scale livestock and produce growers and processors. Education is on best practices that enable them to provide a safe food product. Good Agricultural Practice (GAP) certification work will occur with producers and collaborative efforts will be used. This project also encompasses the requests and resulting work by individuals/groups for information through phone, e-mail or in-person on general food safety questions. Work is also being done with growers who do not need GAP certification for marketing their product but do want to protect themselves and their customers by completing a food safety plan.
Research is studying methods for detection and evaluation of potential growth and survival of pathogens of concern to Vermont artisan cheese makers to improve cheese safety. Additionally research is developing and applying novel tools to advance and understand immunity and disease resistance in dairy cows.

2. Brief description of the target audience

- Adults
- Public: General

- Small scale meat and produce farmers
- Artisan cheese makers

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	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	7	7

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Consultations
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Newsprint Article
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Research projects

Year	Actual
2014	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of people who show improvement in food safety and preservation practices
2	Number of approaches to identify food safety concerns from milking to marketing Vermont artisan cheese.

Outcome #1

1. Outcome Measures

Number of people who show improvement in food safety and preservation practices

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Number of approaches to identify food safety concerns from milking to marketing Vermont artisan cheese.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Demand for artisanal cheeses, including raw milk cheeses, is increasing in the United States and Vermont is a leader in on farm artisanal cheese production with more cheese per capita than any other state. This research addresses food safety concerns for the consumer.

What has been done
Project takes three transdisciplinary approaches to understand and manage artisanal cheese food safety, including on-farm and consumer research addressing raw fluid milk marketed direct to consumers and raw milk products produced on Vermont farms.

Results
The first approach identifies pathogen epidemiology and testing, food safety concerns and practical risk management practices at the site of dairy product production. The second approach seeks to understand consumer attitudes, beliefs, and practices related to raw milk products. The third approach integrates the findings from the research efforts to develop outreach materials targeting artisanal cheese producers and stakeholders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
604	Marketing and Distribution Practices
607	Consumer Economics
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

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
- Other (Food safety requirements of food)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Urban Non Point Source Pollution

☐ Reporting on this Program

Reason for not reporting

Efforts addressing water are captured in other planned programs especially Global Food. Sea Grant is not supported by any Smith Lever dollars so should not be captured in this reporting system.

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	0%		100%	
123	Management and Sustainability of Forest Resources	0%		0%	
124	Urban Forestry	0%		0%	
125	Agroforestry	0%		0%	
133	Pollution Prevention and Mitigation	0%		0%	
211	Insects, Mites, and Other Arthropods Affecting Plants	0%		0%	
216	Integrated Pest Management Systems	0%		0%	
	Total	0%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	2.8	0.0	0.6	0.0
Actual Paid	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual Volunteer	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

This planned program is not supported by any Smith Lever dollars, therefore not appropriate for Extension's reporting in this system.

Design, testing and implementation of materials and technologies for the removal of phosphorus from agricultural run-off and suburban wastewater non-point sources

2. Brief description of the target audience

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2014

Actual: {No Data Entered}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	2	4	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Consultation

Year	Actual
2014	0

Output #2

Output Measure

- Demonstration

Year	Actual
2014	0

Output #3

Output Measure

- Field day/Fair

Year	Actual
2014	0

Output #4

Output Measure

- Presentation

Year	Actual
2014	0

Output #5

Output Measure

- Fact Sheet

Year	Actual
2014	0

Output #6

Output Measure

- Tour

Year	Actual
2014	0

Output #7

Output Measure

- Train the Trainer

Year	Actual
2014	0

Output #8

Output Measure

- Web page updating

Year	Actual
2014	0

Output #9

Output Measure

- Workshop series

Year	Actual
2014	0

Output #10

Output Measure

- Workshop - single session

Year	Actual
2014	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number participants annually in student-led program to educate and assist lakeside property owners to implement pollution prevention and watershed/lake restoration activities for Lakes St Catherine?s, Carmi, Hortonia
2	Number members of sports fishing angler organization annually participate actively in annual sports fisheries protection, enhancement and habitat conservation efforts
3	Number feet of shoreline/bank vegetation replanted or native vegetation maintained annually
4	Number volunteer days annually committed by local organizations to watershed/lake restoration and monitoring activities
5	Number LEAP youth watershed teams annually assist 10 lakeshore property owners annually to implement NPS pollution prevention projects
6	no new AIS species recorded from Lake Champlain basin
7	Number basin stakeholders and managers use invasive smelt and other AIS research results to manage sports fisheries.
8	Lake Champlain bass tournament organizers adopt aquatic invasive species (AIS) spread prevention BMP/HACCP tournament protocols
9	Number marinas become part of Clean Marinas and/or Clean Boating programs each year.
10	Number marina users join their marina?s Clean Boating program each year
11	Black bass conservation plan developed for City/Town of Plattsburgh, NY
12	Number of town plans annually include ordinances, polices, or other support for sustainable coastal development
13	Number municipalities annually implement green infrastructure and Low Impact Development (LID) strategies
14	Number commercial properties in targeted impaired watersheds use low input grounds care each year
15	Number gallons of storm water prevented from reaching local water bodies each year
16	Number local officials/leaders annually request input and information on flood resiliency planning
17	Number municipalities annually with new or updated shoreline/riparian vegetation protection or restoration ordinances

18	Number basin municipalities annually apply BMP for climate change related shoreline erosion and bank stabilization
19	Number bioengineering plan adopted for planned Burlington bike path restoration
20	Number fish culture facilities annually in NY and VT adopt NRAC recommended biosecurity BMP practices
21	Number households annually reduce consumption of fish or fish products with high mercury content

Outcome #1

1. Outcome Measures

Number participants annually in student-led program to educate and assist lakeside property owners to implement pollution prevention and watershed/lake restoration activities for Lakes St Catherine?s, Carmi, Hortonia

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

133 Pollution Prevention and Mitigation

Outcome #2

1. Outcome Measures

Number members of sports fishing angler organization annually participate actively in annual sports fisheries protection, enhancement and habitat conservation efforts

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #3

1. Outcome Measures

Number feet of shoreline/bank vegetation replanted or native vegetation maintained annually

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #4

1. Outcome Measures

Number volunteer days annually committed by local organizations to watershed/lake restoration and monitoring activities

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #5

1. Outcome Measures

Number LEAP youth watershed teams annually assist 10 lakeshore property owners annually to implement NPS pollution prevention projects

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #6

1. Outcome Measures

no new AIS species recorded from Lake Champlain basin

2. Associated Institution Types

- 1862 Extension

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)

{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #7

1. Outcome Measures

Number basin stakeholders and managers use invasive smelt and other AIS research results to manage sports fisheries.

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #8

1. Outcome Measures

Lake Champlain bass tournament organizers adopt aquatic invasive species (AIS) spread prevention BMP/HACCP tournament protocols

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #9

1. Outcome Measures

Number marinas become part of Clean Marinas and/or Clean Boating programs each year.

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #10

1. Outcome Measures

Number marina users join their marina?s Clean Boating program each year

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #11

1. Outcome Measures

Black bass conservation plan developed for City/Town of Plattsburgh, NY

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #12

1. Outcome Measures

Number of town plans annually include ordinances, polices, or other support for sustainable coastal development

2. Associated Institution Types

- 1862 Extension

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)

{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #13

1. Outcome Measures

Number municipalities annually implement green infrastructure and Low Impact Development (LID) strategies

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #14

1. Outcome Measures

Number commercial properties in targeted impaired watersheds use low input grounds care each year

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #15

1. Outcome Measures

Number gallons of storm water prevented from reaching local water bodies each year

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	5000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #16

1. Outcome Measures

Number local officials/leaders annually request input and information on flood resiliency planning

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #17

1. Outcome Measures

Number municipalities annually with new or updated shoreline/riparian vegetation protection or restoration ordinances

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #18

1. Outcome Measures

Number basin municipalities annually apply BMP for climate change related shoreline erosion and bank stabilization

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #19

1. Outcome Measures

Number bioengineering plan adopted for planned Burlington bike path restoration

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #20

1. Outcome Measures

Number fish culture facilities annually in NY and VT adopt NRAC recommended biosecurity BMP practices

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #21

1. Outcome Measures

Number households annually reduce consumption of fish or fish products with high mercury content

2. Associated Institution Types

- 1862 Extension

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)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Other (techology limitations in areas)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

Childhood Obesity (Outcome 1, Indicator 1.c)	
0	Number of children and youth who reported eating more of healthy foods.
Climate Change (Outcome 1, Indicator 4)	
0	Number of new crop varieties, animal breeds, and genotypes whit climate adaptive traits.
Global Food Security and Hunger (Outcome 1, Indicator 4.a)	
1309	Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.
Global Food Security and Hunger (Outcome 2, Indicator 1)	
0	Number of new or improved innovations developed for food enterprises.
Food Safety (Outcome 1, Indicator 1)	
0	Number of viable technologies developed or modified for the detection and
Sustainable Energy (Outcome 3, Indicator 2)	
12	Number of farmers who adopted a dedicated bioenergy crop
Sustainable Energy (Outcome 3, Indicator 4)	
0	Tons of feedstocks delivered.