2011 University of Connecticut - Storrs Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

The University of Connecticut's College of Agriculture and Natural Resources (CANR) is committed to research that solves problems and investigates new areas relevant to agriculture, food, forestry, the environment, and human health. CANR is also the academic home for the Extension faculty and staff members located at Connecticut's' Extension Centers throughout the state.

The Department of Extension programs disseminated CANR's research results through their network system, eXtension and 110 formal outreach programs. A key component to the Extension program was training of volunteers who became trainers themselves, leveraging the federal-state financial partnership in Connecticut's Cooperative Extension System. There is no county government in Connecticut, so the state has to pick up that part of the funding mechanism as well. Through program efforts, approximately 500,000 clientele contacts were achieved during the past year. Additionally, many citizens were served via e-mail and websites managed/contributed by Department of Extension members.

Scholarly productivity for clientele and peers was used to develop and enhance high quality outreach education programs through the publishing or development of two books, 11 manuals/curricula, 11 full length refereed journal articles, two new software packages, five audio recordings, 48 conference proceedings (short papers, abstracts, or posters), 51 Extension bulletins, and 18 non-refereed journal articles or technical reports. Additionally, 64 other scholarly works were prepared including newspaper, popular magazine, and newsletter articles as well as other works to disseminate information, results, and impacts to large and diverse audiences of clientele and peers. Service on editorial boards and conference proceedings numbered 52, and those invited to present scholarly colloquia numbered 41. Ten faculty served as officers of large national/international learned societies and ten served on national/international peer review committees.

The Office of Research and Graduate Education is responsible for facilitating CANR's research effort, which is supported by capacity and competitive funds. The Storrs Agricultural Experiment Station manages the capacity research funding provided through the federal-state partnership. Competitive funds are obtained from a variety of federal and non-federal sources through the independent initiative of CANR's faculty and staff. We encourage fundamental and applied research to gain knowledge and implement results relevant agriculture fields, and multidisciplinary collaborations between institutions, agencies and fields of study to advance national goals established by the United States Department of Agriculture National Institute of Food and Agriculture (USDA NIFA).

An essential part of the CANR research mission is to provide a framework for graduate student training preparing the next generation of scientists for solving the state's, region's and nation's challenges. In 2011, formula funds provided support for over 100 student researchers. In addition, 105 peer review publications and approximately 50 conference presentations were generated by Project Investigators.

This Report of Accomplishments highlights our Extension programs and formula funded research projects. FTE's are reported lower than projected in our 2011 Plan of Work. Extension reports 60.8 FTE's and research reports 39 FTE's. This is reduced from projected 82 and 78 respectively in the 2011

POW. The reduction in FTE's in due to the elimination of EFNEP and administrative positions that were previously included in our FTE calculations. The information in this report is organized into 6 planned program areas; Food Safety, Climate Change, Childhood Obesity, Food Security and Global Hunger, Youth, Families and Communities, and Sustainable Energy.

Food Safety:

Extension programs addressed consumer concerns of food safety, with an emphasis on foodborne illness, through workshops, web pages, and press releases. Training on foodborne illness prevention and basic food safety regulations was provided to volunteers, temporary food service workers, and those who staff food pantries, soup kitchens, camps, schools, and retail sellers. In addition, workshops and training on Good Agricultural Practices (GAP) and post harvest handling, and IPM were implemented. GAP education programs targeted Connecticut fruit and vegetable farmers.

Formula funds provided resources to initiate/sustain14 research projects. These projects trained 30 graduate students in food safety related research. Projects resulted in a change in knowledge, adoption of new practices, and training the next generation of scientists.

Climate Change

Extension programs promoted "smart" landscaping techniques that reduced polluted runoff and groundwater contamination by infiltration and filtration as well as reduced occurrences of water shortages. Extension methods included the use of demonstration sites (rain gardens, native plant landscapes, low fertilizer and low pesticide input lawns). In addition, education materials, websites and bulletins were produced. Programs included:

- The Land Use Academy, which provided training to municipal officials to make informed decisions on land use policy and implementation for their communities;
- The Center for Land Use Education and Research (CLEAR) provided training conferences, video programs and webinars for municipal officials and volunteers on the impacts of land use on natural resources.
- The Green Valley Institute educated officials and residents in 13 towns in a National Heritage Corridor spanning Connecticut and Massachusetts on how to research and develop innovative models for land trusts, and other policies for achieving sustainable growth.
- Training conferences for municipal officials and volunteers

Formula funds supported 8 Climate Change research projects that contributed to new knowledge and practices to protect the agriculture system. These projects funded the training of 15 graduate students through their involvement in basic and applied research studies and generated 22 peer-reviewed publications.

Childhood Obesity

Obesity in children and youth due to inactivity and high intakes of excessive calories and poor sources of nutrient density is increasingly problematic, especially within urban and minority populations. Our Extension efforts attempted to mediate this trend and reverse its direction. 4-H Fitness and Nutrition (FANS) clubs were formulated; 4-H summer and year round nutrition programs (4-H SYNEP) were conducted in summer lunch programs and community centers. A variety of interactive approaches were used to enhance of school, parent and child interactions through family resource centers, parent teacher organizations, community gardens and community agencies. Teen leaders were utilized to help design, organize and present nutrition and fitness programs.

Formula funds supported 10 Hatch projects in the Childhood Obesity Planned Program. These projects funded the training of 26 graduate students through their participation in basic and applied research studies conducted to guide individuals and families to make informed, science-based decisions to

improve health and reduce childhood obesity through optimal diets. In addition 32 peer-reviewed publications were generated.

Food Security and Global Hunger

Extension partnered with other State agencies and organizations to reach farmers and producers with farm management strategies, particularly business practices, marketing and production strategies, through workshops and individual consultations. In addition, conferences, displays at conferences, meetings and social events, web page updates and webinars were held to facilitate the growth and expansion of the food industry both in and outside the state, and implement programs to conserve the natural resources of Connecticut

Formula funds supported 18 research projects. These projects funded the training of 35 graduate students and generated 32 peer reviewed publications through research projects designed to improve understanding, gain knowledge and adopt new practices in a variety of areas to enhance agricultural production and improve our capacity to meet food demand, and address food security.

Youth, Families and Communities

Connecticut's Extension enterprise focused its efforts on helping create places where children, young people and their families will be safe, healthy, educated, socially and culturally aware, and thus lead productive lives in their communities. 4-H members achieved these goals through participation in a wide range of programs grouped in the three core competencies of STEM (Science, Technology, Engineering and Math), healthy lifestyles and leadership/community service.

Sustainable Energy

Energy programs in Connecticut take two forms: (1) educational programs stressing conservation and efficient use of energy in agriculture as part of farm and risk management and in homes as a component of family financial management, and (2) emerging energy research focusing on bio-resources and their potential to produce energy locally, design optimum forest products and crops for bioenergy production, and to produce bio-based products.

Formula funds supported 3 research projects contributing to the development of biomass used for biofuels and production of value-added bio-based industrial products. These research projects generated 2 peer-reviewed publications and trained 2 graduate students in sustainable energy research.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	82.0	0.0	78.0	0.0
Actual	60.8	0.0	39.0	0.0

II. Merit Review Process

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

- Combined External and Internal University External Non-University Panel
- Expert Peer Review

2. Brief Explanation

The merit review process for Connecticut continues to be based on the seven part test of guiding characteristics for an engaged institution as reported in the 1999 Kellogg Commission Report on The Engaged Institution. The 2006 ECOP Criteria of Excellence in Cooperative Extension also serves as a major standard for merit review. In brief, the process includes: planning by all faculty and staff by departments and focused issue groups; review of planning at the campus level; periodic reviews by peer institutions, and a review by stakeholders. The College Advisory Group of stakeholders provided overall direction for research, education and Extension. Specifically, peer review for Hatch, McIntire-Stennis, and Animal Health Projects continues to ensure that quality research projects, consistent with identified priorities, are approved. Review involves the objective opinion of other scientists, and/or administrators within the University of Connecticut, and users of research results, when appropriate, to research proposals or completed projects. Peer review ensures that every project receives a rigorous and systematic evaluation for appropriateness and quality. The process was conducted within the framework of predetermined criteria whose objective was to assess whether each Storrs AES research project (1) is guided by state, regional, and national priorities, (2) is of high scientific merit and quality, (3) incorporates a state-of-the-art scientific approach (4) is likely to successfully meet the goals of the project, and (5) whether it is completed and prepared according to the Storrs AES guidelines. The peer review process provided principal investigator with additional counsel on research direction and implementation. Department Heads participated in the peer review process by suggesting qualified reviewers. The Director of the Storrs AES/the Associate Dean distributed projects to qualified reviewers and approved edited projects once they were critically reviewed.

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 non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public

Brief explanation.

The college-wide stakeholder input process continued to include considerations for both research and extension. Regular consultation with the recently assembled College Advisory Board, the state-wide Farm Risk Management Advisory Committee comprised of farmers, producers, public and private agricultural agency service providers, and private agricultural-related businesses provided a continuous view of the needs in the state as well as emerging trends and concerns. State-wide reports, prepared by other agencies and organizations (several of whom have Extension faculty on boards/commissions), such as the state of Connecticut's Voices of Children report, and the Connecticut Food Policy Council's annual report on food insecurity in the state, continued to be important sources of input, accessing information from potential stakeholders. Increased use of web-based needs assessments, the participation of faculty and staff on state boards, commissions and councils, and on-going input from County Extension Councils, resulted in stakeholder participation. The Dean continued discussions with key stakeholders, members of the

legislature and clientele. A college-wide research meeting, which included researchers, Extension educators and resident education faculty, was held as a means of identifying current and future directions and sharing those across disciplines and College units.

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
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

Progress continues in soliciting and receiving increased stakeholder input. The State Extension Partner's Council meets at least twice a year and is comprised of representatives of County Extension Councils and other affiliated organizations such as 4-H camp boards, IFYE, and the Master Gardener Association. Greater rotation of participant representatives has been encouraged. Each Extension Partners group or organization is expected to conduct a general public needs assessment for statewide programming, involving Connecticut residents who are not members of the specific partners' group or organization. Periodic Dean's updates sent to all faculty and staff via e-mail/web, reports on his conversations with stakeholders and clientele. Use of on-line tools to solicit input from potential and current clientele and stakeholders continues to increase. The Dean's College Advisory Board addresses the broad needs of Connecticut in their meetings.

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

Brief explanation.

Traditional stakeholders such as vegetable producers and town officials provided input through end-of-session evaluations of programs with suggestions for improvements, as well as current and future needs. The CANR Journal, a periodic newspaper available via e-mail/web page, highlighted research and extension efforts and is available to the public, with comments solicited. The Sea Grant program collected input from aquaculture producers and town officials that directed change in programming focus and direction. Meetings with state boards such as the Food Policy Council and Farm Services Agency staff provided additional stakeholder input. The Farm Risk Management Advisory Group, comprised of more than 40 agriculture-related stakeholders from both traditional and non-traditional perspectives, provided input on a regular basis through facilitated discussions at

meetings. Increased use of the Internet, both e-mail and the Web, is provided input from a wide range of current and potential clientele.

3. A statement of how the input will be considered

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

Brief explanation.

Input was used to redesign programs, to initiate new programs, as the basis for grant proposals, and as a means for acquiring diverse perspectives when the College considers restructuring programs. Implementing the College Strategic Plan required input from stakeholders. College administration met regularly with stakeholders, the legislature and agency heads to both listen to and discuss stakeholder input.

Brief Explanation of what you learned from your Stakeholders

Agricultural stakeholders continued to be concerned about federal agricultural programs that require significant paperwork, and those that are not available in Connecticut. Small scale producers feel at a disadvantage.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2131815	0	1250875	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	1843901	0	1025961	0
Actual Matching	1843901	0	1025961	0
Actual All Other	2451850	0	3553796	0
Total Actual Expended	6139652	0	5605718	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	140331	0	387576	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Food Safety
2	Climate Change
3	Childhood Obesity
4	Global Food Security and Hunger
5	Family Youth and Communities
6	Sustainable Energy

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Food Safety

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
205	Plant Management Systems	13%		0%	
206	Basic Plant Biology	0%		5%	
212	Pathogens and Nematodes Affecting Plants	6%		9%	
215	Biological Control of Pests Affecting Plants	6%		9%	
216	Integrated Pest Management Systems	19%		9%	
307	Animal Management Systems	6%		0%	
311	Animal Diseases	25%		52%	
313	Internal Parasites in Animals	6%		4%	
315	Animal Welfare/Well-Being and Protection	0%		4%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	13%		4%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	6%		4%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	11.9	0.0	13.8	0.0
Actual Paid Professional	8.4	0.0	7.5	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**
273934	0	240160	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
273934	0	240160	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
515334	0	769917	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Planned progam activities included programs for consumers, agencies and organizations, and farmer and food processors.

For Consumers: Workshops on general food safety topics such as foodborne illness prevention, basic food safety regulations, and others were completed. A consumer-focused website with basic food safety information - fact sheets, contact information and how to e-mail a question was also available.

For agencies and organizations: Food Safety training workshops were provided for personnel involved with soup kitchens, shelters, camps, day care centers and other community food service providers.

For farmers/shellfishermen/ food processors: Workshops and training on Good Agricultural Practices (GAP) and post harvest handling, and IPM were implemented.

In addition, Formula funds provided resources to initiate/sustain13 research projects. These projects trained 30 graduate students in food safety related research and generated 17 peer-reviewed publications. Projects resulted in a change in knowledge, adoption of new practices, and training the next generation of scientists. Projects highlights include:

For the research project, Mastitis resistance to enhance dairy food safety, study results demonstrated that microbial inhibition antibiotic residue screening tests can detect natural antimicrobials and indicated that these compounds may affect microbial activity of cultured milk products. Natural antimicrobials have the potential to be efficacious, meet organic standards and be evaluated for approval by the FDA.

Assays were developed for detection of viruses of the genus circovirus, and U.S. avian ciroviruses characterized and grown in vitro as part of an , Investigation of avian cirovirus infection and attempted development of an infection study model of cirovirus infection in ducks or geese,. Research data provided information on the current state of knowledge on ciroviruses to commercial duck, geese and game bird industries, and to state/national wildlife agencies and societies.

An improved diagnostic test for poultry H3 subtype avian influenza viruses (AIV) by reverse transcription loop-mediated isothermal amplifications assay was developed. The H3-RT LAMP assay is a simple, sensitive, rapid test that can identify H3 subtype AIVs visually. Consequently, it is a cost-effective

nucleic acid amplification method that does not require any specialized equipment. Therefore, its application will be suitable to farm setting laboratories.

The research project, Detection and control of porcine reproductive and respiratory syndrome (PRRS) virus and emerging viral diseases of swine, results showed that regardless of the IFN&beta levels detected in ELISAs, TNF&alpha expression appeared to be blocked early post-infection. Improved methods for detection of swine IFN&beta were developed which will positively impact our understanding of PRRS pathogenesis related to inefficient induction of innate immune responses, and aid in vaccine assessment.

A ressearch project, Characterize the role of rpoS gene on the survivial of C. sakazakii in adverse environmental stress condtions, was undertaken to investigate the molecular mechanisms that permit survival of Cronobacter sakazakii (C. sakazakii) under adverse environmental stresses. C. sakazakii is an emerging pathogen with a mortality rate of 50 to 75% in neonates and children. It has been implicated in several infant formula-borne outbreaks of central nervous system infections and necrotizing enterocolitis in many countries, including the U.S. Further, C. sakazakii has been isolated from dry infant formula and has resulted in several recalls of contaminated formula in the U.S. Understanding the molecular mechanisms behind the stress tolerance of C. sakazakii would potentially lead to improved strategies for preventing outbreaks of C. sakazakii infections.

2. Brief description of the target audience

Consumers, homeowners,
Landscape managers, groundskeepers. master gardeners
Farmers/shellfishermen - produce, meat and poultry, cider/juices, cheeses; seafood
Agency and organizations (staff) that serve or handle food at: camps; food pantries and soup kitchens; schools; day care centers, Head Start, senior centers, etc.
Food related businesses - processors, farmers' market masters and vendors, etc. Seafood industry: seafood processors, dealers, harvesters, importers, and regulatory personnel.
Researchers and food microbiologists

3. How was eXtension used?

eXtension was used as a reference when handling phone calls and internet inquiries. It is also cited as a resource at workshops and programs for those with access to the internet. In addition, eXtension was used to announce news and events.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	4671	5603	100	205

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	9	17	26

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Face to face general group education sessions (workshops, etc.)

Year	Actual
2011	138

Output #2

Output Measure

- New or updated web page(s)

Year	Actual
2011	4

Output #3

Output Measure

- Diagnostic tests conducted
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Individual consultations (in person, via e-mail, etc.)

Year	Actual
2011	3000

Output #5

Output Measure

- Training conferences or sessions hosted or conducted

Year	Actual
2011	75

Output #6

Output Measure

- Fact sheets, bulletins and newsletters written or edited

Year	Actual
2011	138

Output #7

Output Measure

- Training undergraduate and graduate students and Post Doctoral Researchers

Year	Actual
2011	43

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of consumer gaining basic food safety knowledge
2	Consumers (%) adopting appropriate food safety practices.
3	Number of organizations/businesses serving food adopting appropriate food safety practices.
4	Increased adoption (%) of recommnended BMP by consumers.
5	Increased adoption (%)of recommeneded BMP by growers.
6	Adoption of GAP by growers (%)
7	Aquaculture food safety practices

Outcome #1

1. Outcome Measures

Number of consumer gaining basic food safety knowledge

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Consumers (%) adopting appropriate food safety practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	85

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There are two trends driving an increased interest in home food preservation. The first is an interest in eating foods grown and produced locally. This may include purchasing food from local farmers or "growing your own". The second trend relates to economic recession. Consumers believe that by buying locally grown produce or by growing their own produce and preserving it that they will reduce food costs.

What has been done
Workshops on home food preservation were held. The basic techniques of home food preservation were presented using power point presentations, equipment demonstrations, and informational handouts including a list of resources.

Results
Six home food preservation workshops were provided at Extension Centers in Connecticut. One-hundred seventy-three persons attended these workshops and a total of 100 individuals responded to evaluation tools. Eighty-five percent indicated that they learned something new about food safety and home food preservation. Thirty percent responded that they planned to change a home food preservation behavior as a result of the information they gathered at the

program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #3

1. Outcome Measures

Number of organizations/businesses serving food adopting appropriate food safety practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In recent years there has been an increase in food borne disease outbreaks attributed to fresh produce. As a result, federal and state regulatory agencies have published guidance documents recommending the adoption of Good Agricultural Practices (GAP); and retailers are requiring produce suppliers to adopt GAP and submit to third party audits of their operations.

What has been done
The team-based approach to presenting GAP has provided a cross-cutting effective means to provide producers with the knowledge and tools needed to create effective plans.

Results
Eighty-four percent of producers who participated in food safety training reported an increase in their knowledge of safe food handling practices. Fifty percent responded that they gained critical knowledge necessary for writing a GAP safety plan.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
307	Animal Management Systems
311	Animal Diseases
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #4

1. Outcome Measures

Increased adoption (%) of recommnended BMP by consumers.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Increased adoption (%)of recommeneded BMP by growers.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Deep zone tillage (DZT), minimizes field preparation costs; reduces energy use; eliminates soil, nutrient and pesticide runoff; helps restore soil health and fertility; provides farmers access to open space; reduces irrigation demands; and provides the ultimate climate change tool for a region that is forecast to become warmer and wetter. Deep zone tillage facilitates soil moisture retention during dry conditions because the soil surface is protected by mulch; it allows plant roots to grow through the plow pan and fully permeate the soil profile.

What has been done
This project consisted of a soil compaction and organic matter survey and a sequence of outreach meetings and articles, all with the goal of hastening the adoption of deep zone tillage in CT and New England. Reduced-tillage growers and Extension educators partnered and used workshops, twilight meetings, conferences, discussion groups, newsletter/web site articles and case studies to disseminate zone-tillage information. Last year 10 new farms converted to using DZT.

Results
Five new CT and one MA grower adopted DZT this year. New growers used DZT on 410 acres of vegetables and corn. These five growers saved approximately 1,332 gallons (72%) of diesel fuel. They also reduced the time it took to prepare fields for planting by 67% or 410 total hours (saved). These hours saved represent an opportunity (costs) to accomplish tasks or chores which otherwise would not have been achieved and which could affect the farms' profitability. The addition of drainage directly under the crop row, by breaking up the plow pan with DZT, makes it possible to farm more effectively in wet soils and climates.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
311	Animal Diseases
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

Outcome #6

1. Outcome Measures

Adoption of GAP by growers (%)

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Aquaculture food safety practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	12

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In order to grow marine aquaculture in the U.S, industry and managers need better information in a format that is easy to access and use. By providing industry and managers with an innovative and inexpensive geospatial tool built on scientific information, they will be positioned to make better informed, and more efficient and accurate decisions with respect to harvesting shellfish especially when storm degradation affects the eco-system in specific sited permitted beds.

What has been done
Audiences ranging from industry members to resource managers to individuals and organizations involved in stock enhancement and restoration projects are increasingly expected to utilize geographically-referenced information to develop and evaluate applications for aquaculture related activities.

Results
The University of Connecticut Center for Land Use Education and Research (CLEAR) developed an interactive online map viewer, The Connecticut Shellfisheries Mapping Atlas, to provide users with the tools and information necessary to make informed decisions regarding the siting of aquaculture and related activities. The online viewer was built using ESRI's ArcGIS API for Flex which allowed for the creation of rich Internet applications on top of ArcGIS Server. Twelve shellfish producers have learned to utilize this technology.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
311	Animal Diseases
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities

Brief Explanation

The state of the economy is major factor in conducting programs. Extension seeks

cost recovery as allowed but producers have fewer resources to devote to farm management. Many government programs are operating at less than normal, staffing and resources. That means that inspections, support and education are less than optimal.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Through a variety of evaluation tools including pre-testing, time series and post- testing, Extension Educators surveyed participants utilizing both written and internet based methods. Clicker technology was also used as an avenue to judge responses during programs. In all situations, program participants felt comfortable making use of materials presented, and when technology was readily available, accessing information from the web. Participants also reported changes in attitude following completion of programs and felt they would make their new found knowledge a permanent change. For detailed results see State Defined Outcomes section.

Key Items of Evaluation

Activities that engaged continual evaluation and feedback from participants and stakeholders were motivating factors in obtaining desired feedback. Team leaders were asked to review processes for educational value to ensure planned programs were being followed and that programs remained significant and relevant in their focus.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Climate Change

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	11%		18%	
104	Protect Soil from Harmful Effects of Natural Elements	3%		5%	
111	Conservation and Efficient Use of Water	3%		5%	
112	Watershed Protection and Management	25%		12%	
123	Management and Sustainability of Forest Resources	6%		23%	
124	Urban Forestry	3%		0%	
125	Agroforestry	6%		5%	
131	Alternative Uses of Land	0%		5%	
132	Weather and Climate	0%		5%	
135	Aquatic and Terrestrial Wildlife	0%		5%	
136	Conservation of Biological Diversity	0%		4%	
205	Plant Management Systems	10%		0%	
216	Integrated Pest Management Systems	11%		8%	
605	Natural Resource and Environmental Economics	0%		5%	
608	Community Resource Planning and Development	22%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	13.8	0.0	17.7	0.0
Actual Paid Professional	17.6	0.0	11.9	0.0
Actual Volunteer	17.8	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**
384732	0	179916	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
384732	0	179916	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
922691	0	1076700	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

In Connecticut, forest land is fragmented and disappearing at a rate of almost 8,000 acres per year to commercial and residential development. Decisions made by towns, cities and the citizens who live in the state's 3 major watersheds directly affects the health of Long Island Sound, which in turn contributes to climate ecology. Extension programs promoted "smart" landscaping techniques that reduced polluted runoff and groundwater contamination by infiltration and filtration as well as reduced occurrences of water shortages. Extension methods included the use of demonstration sites (rain gardens, native plant landscapes, low fertilizer and low pesticide input lawns). In addition, educational materials, website articles and bulletins about "new" lawn care recommendations were produced. Education and consultations regarding nutrient management plans assisted farmers in reducing nonpoint source pollution and runoff.

Planned program activities included

- The Land Use Academy, which provided training to municipal officials to make informed decisions on land use policy and implementation for their communities.
- The Center for Land Use Education and Research (CLEAR) provided training conferences, video programs and webinars for municipal officials and volunteers on the impacts of land use on natural resources.
- The Green Valley Institute educated officials and residents in 13 towns in a National Heritage Corridor spanning Connecticut and Massachusetts on how to research and develop innovative models for land trusts, and other policies for achieving sustainable growth.
- Training conferences for municipal officials and volunteers (Land Use Academy, GIS, town tree wardens, etc.)
- Public workshops and train-the-trainer sessions
- Master Gardener support and training
- Connecticut Environmental Action Day for high school students
- Fact sheets, web pages, and general media.
- Development of computer-based technologies, video programs and webinars.

Formula funds provided resources to fund 8 Climate Change research projects that contributed to new knowledge and practices to protect the agriculture system. These projects funded the training of 15 graduate students through their involvement in basic and applied research studies and 23 peer-reviewed publications. Research Highlights included:

A Hatch-funded project, "Object-oriented land cover classification of spatially-enhanced satellite remote sensing data," was undertaken by researchers at the University of Connecticut's Center for Land Use Education and Research (CLEAR); this created a spatial, thematically rich, land use and land cover map for the state of Connecticut. In addition, CLEAR's Connecticut's Changing Landscape (CCL) land cover data and derived projects which are accessible via the CLEAR website (clear.uconn.edu) received more than 1,000 hits per month. This project also expanded the CCL land cover data to include Westchester County and northern Long Island, NY. This is a valuable source of information for resource managers, and is used by CT Department of Energy and Environmental Protection, the CT Council on Environmental Quality, U.S. Environmental Protection Agency, and the National Oceanic and Atmospheric Administration.

A research project, "Stream temperature and brook trout population fragmentation: riverscape genetics in headwater stream channel networks in Connecticut," studied the effect of rising water temperature on brook trout (Salvelinus fontinalis) persistence. Two study sites were chosen that were characterized by high brook trout abundance, lower anthropogenic impact, large watershed size and within-watershed connectivity, relative to other brook trout populations in the state. Multilevel regression models indicated that stream temperature and habitat volume predicted trout abundance, and that trout abundance within all size classes could decrease when stream temperature increased and stream discharge decreased. This finding was significant because these conditions are predicted to be exacerbated during summer months in the northeastern United States under future climate change. In particular, larger individuals were predicted to decline disproportionately to other size classes, and this would be expected to negatively impact reproductive success as it is the larger fish that generally ensure continuation of the next generation. Research results were disseminated at conferences and in scientific publications to provide data for policy development that seeks to balance human activities and conservation of coldwater streams.

Phragmites is considered an invasive species in Connecticut. The research project, "Physiological Responses of Phragmites australis to the Timing of Plastic Covering Treatments" has continued to seek science-based IPM approaches as alternatives to chemical herbicide control. Specifically, the physiological responses of Phragmites australis to three different treatments has been investigated. These include: plastic covering at two different time periods and a control. Rhizome carbohydrate storage, which is important for phragmites regeneration and spring regrowth, is also being assessed before and after treatment applications.

2. Brief description of the target audience

State agency staff, elected municipal officials, municipal staff and volunteers, citizens, eenvironmental groups, forest land owners, fisheries managers, conservation biologists, utility infrastructure managers, golf course superintendents, invasive plant specialists.

3. How was eXtension used?

eXtension was used as a reference when handling phone calls and internet inquiries. It was also cited as a resource at workshops and programs for those with access to the internet. In addition, eXtension was used to announce news and events.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	23835	1046946	70	630

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	42	22	64

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Face to face general group education sessions (workshops, etc.)

Year	Actual
2011	2132

Output #2

Output Measure

- New or updated web page(s)

Year	Actual

2011	60

Output #3

Output Measure

- Training conferences or sessions hosted or conducted.

Year	Actual
2011	114

Output #4

Output Measure

- Fact sheets, bulletins and newsletters written or edited.

Year	Actual
2011	266

Output #5

Output Measure

- Training of Undergraduate and Graduate Students

Year	Actual
2011	31

Output #6

Output Measure

- Individual Consultations (in person, via Email, etc)

Year	Actual
2011	60394

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Acres of land permanently protected and managed.
2	Adoption and/or revision of land use public policies by governmental agencies.
3	Consumers become knowledgeable about recommended environmental practices relating to forests, water quality and conservation, lawn care, well and septic systems, and/or shoreline buffers.
4	Understanding of basic forest ecology.
5	Increased use (%) of GIS and other technologies by local officials in making land use and other environmental decisions.
6	Private well owners will adopt practices to protect their private drinking water supply (routine testing, treatment, well system maintenance).

Outcome #1

1. Outcome Measures

Acres of land permanently protected and managed.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	800

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Working Lands Alliance (WLA) was formed in 1999 with the sole purpose of preserving Connecticut's farmland. WLA is a coalition that is directed by a steering committee which includes 2 Extension Educators. Among its supporters are more than 600 individuals and 200 businesses and organizations that include farmers, conservationists, anti-hunger groups, planners and local food enthusiasts. This coalition has joined together in an effort to halt the loss of Connecticut's remaining farmland.

What has been done
WLA worked closely with partners to ensure that funding provided through the state?s Community Investment Act, a law requiring a deed-recording fee be assessed on all property sold or transferred with the proceeds going to a fund for farmland preservation, open space preservation, historic preservation, tourism and affordable housing, was not diverted for competing state budget needs.

Results
As a result of the educational work done by the Working Lands Alliance including Extension educators, more than $35 million was distributed in grants and loans that was further leveraged by an additional $76 million. Funds were used for the Connecticut State Department of Agriculture's Farm Enhancement Program, a program that helps Connecticut farms diversify and expand through cost-sharing grants. And the Purchase of Development Rights Programs, a program that provides match funds for the Federal Farmland Protection Program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
124	Urban Forestry
125	Agroforestry
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

Adoption and/or revision of land use public policies by governmental agencies.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	110

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Land Use Commissioners and other decision-makers require regular training to maintain their effectiveness. This program helps Connecticut municipalities make informed land use decisions which promotes responsible growth and helps protects municipalities from the consequences of potentially illegal decisions.

What has been done
The Land Use Academy (LUA) curriculum was restructured to better integrate presentation topics. Two LUA basic training sessions were held and attended by land use commissioners and decision-makers representing cities and towns in CT. An Audience Response System (clickers) was introduced into the training to encourage audience engagement.

Results
One hundred ten commissioners from 55 municipalities attended and reported that they would adopt recommended land use policies.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
124	Urban Forestry
205	Plant Management Systems
608	Community Resource Planning and Development

Outcome #3

1. Outcome Measures

Consumers become knowledgeable about recommended environmental practices relating to forests, water quality and conservation, lawn care, well and septic systems, and/or shoreline buffers.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Municipalities and land trusts within the coastal region have purchased or received donations of hundreds of acres of coastal habitat with many of these properties within, adjacent to, or ecologically connected to Long Island Sound (LIS) Stewardship Areas. Even though the land is protected from future development, surrounding land use pressures, invasive species, natural succession, and climate change can cause drastic changes to these properties.

What has been done
Management of these areas is often necessary to maintain or restore natural processes, corridors, particular habitats or manage for specific species, in association with the habitats, species, and processes of LIS Stewardship Areas. Consumers and property owners near the donated land were provided with training in recommended environmental practices. Management plans are developed to identify the different types of habitats and management issues in each area.

Results

Three stewardship plans were developed for properties in the coastal zone.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
124	Urban Forestry
125	Agroforestry
205	Plant Management Systems
216	Integrated Pest Management Systems
608	Community Resource Planning and Development

Outcome #4

1. Outcome Measures

Understanding of basic forest ecology.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
For over 300 years, Connecticut's forests have been cut-over, burned and otherwise consumed for human profit. Decades of neglect have alternated with intense periods of indiscriminate cutting. Genetic depletion, poor health and productivity, and loss of wildlife species have been the consequences of poor management. Today, rapid development and land fragmentation, as well as poor cutting practices, continue to threaten our forest and wildlife resources.

What has been done

The Coverts Project is a volunteer training program focused on wildlife habitat management. There is documented public concern for many wildlife species. Increased forest fragmentation has further elevated the importance of this issue to woodlot management. Actively managed demonstration areas were used as outdoor classrooms during an annual, in-depth training seminar and follow-up workshops. A select group of woodland owners and/or environmentally concerned individuals were accepted to participate in the three-day training seminar.

Results
Class size was limited to thirty individuals who own woodlots. They learned about different types of Connecticut forests and about where, how, and why they grow as they do. Instruction was also provided about different wildlife species, their needs, and how to provide for them. They also were introduced to the natural resource professionals and organizations available to help them with woodlot management. An interesting and effective requirement of this approach was the requirement for class attendees to return to their respective communities and collaborate or conduct outreach efforts. This past year 2 projects were undertaken with municipal schools, and 6 projects created stewardship plans.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
124	Urban Forestry
125	Agroforestry
205	Plant Management Systems
608	Community Resource Planning and Development

Outcome #5

1. Outcome Measures

Increased use (%) of GIS and other technologies by local officials in making land use and other environmental decisions.

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Private well owners will adopt practices to protect their private drinking water supply (routine testing, treatment, well system maintenance).

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The economy was a driving factor in our ability to protect our natural resources. At local, regional and state levels, budget deficits associated with the housing market decline, high costs of energy and unemployment created uncertainty in the activities conducted. In additon, we experienced weather challenges from the 2011 snowfall received in Connecticut.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Through a variety of evaluation tools including pre-testing, time series and post- testing, Extension Educators surveyed participants utilizing both written and internet based methods. Clicker technology was also used as an avenue to judge responses during programs. In all situations, program participants felt comfortable making use of materials presented, and when technology was readily available, accessing information from the web. Participants also reported changes in attitude following completion of programs and felt they would make their new found knowledge a permanent change. For detailed results see State Defined Outcomes section.

Key Items of Evaluation

Activities that engaged continual evaluation and feedback from participants and stakeholders were motivating factors in obtaining desired feedback. Team leaders were asked to review processes for educational value to ensure planned programs were being followed and that programs remained significant and relevant in their focus.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Childhood Obesity

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	0%		7%	
607	Consumer Economics	0%		7%	
610	Domestic Policy Analysis	0%		7%	
701	Nutrient Composition of Food	0%		14%	
702	Requirements and Function of Nutrients and Other Food Components	20%		34%	
703	Nutrition Education and Behavior	67%		21%	
724	Healthy Lifestyle	13%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	18.0	0.0	15.0	0.0
Actual Paid Professional	4.1	0.0	9.5	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**
82181	0	224726	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
82181	0	224726	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
250407	0	822490	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Planned program activities included:

- Home visits
- Individual and family consultations
- Demonstrations
- Summer youth activities
- Workshops
- Newsletters
- Training sessions for other organizations and agencies
- Parents and grandparents were engaged through community partnerships to provide nutrition and cooking skills in community settings
- Parent Teacher Organizations outreach activities
- Health Fairs.

Formula funds provided resources to fund 9 Hatch projects and 1 Hatch Multistate project in the Childhood Obesity Planned Program. These projects funded the training of 26 graduate students through their participation in basic and applied research studies conducted to guide individuals and families to make informed, science-based decisions to improve health and reduce childhood obesity through optimal diets. In addition 32 peer-reviewed publications were generated. Research highlights include:

An on-going research project has been implemented to define the extent to which green tea extract (GTE) protects against nonalcoholic fatty liver disease (NAFLD), a spectrum of liver diseases marked by obesity, insulin resistance, excess hepatic lipid accumulation, and inflammation. To date, results suggest that GTE reduces dietary fat-induced hepatic inflammation and oxidative stress by decreasing the activity and expression of COX-2, without altering the flux of arachidonic acid between membrane phospholipid and free fatty acid pools. This study provided research training to 3 graduate students and resulted in 3 peer-reviewed publications.

The impact of dietary protein on iron status in iron deficient individuals was undertaken. Specifically, it sought to uncover the mechanism(s) by which the gene, DMT1, is regulated by protein to explore the mechanisms of dietary protein-induced increases in intestinal iron absorption. Iron balance studies in rats that consumed 5%, 20% and 40% protein diets for 1 week revealed that animals on the 40% protein diet absorbed significantly more iron than animals on the 5% protein diet. Thus far, studies indicates that increasing dietary protein from a low to a high level in the short-term significantly increases intestinal iron absorption, which can be explained, in part, by a concomitant increase in intestinal DMT1 expression and reduced hepcidin expression in the liver. Therefore, selective supplementation of protein may represent one method of improving iron status in deficient individuals.

Investigators conducted research to understand the role of chemosensory function and food preferences for improving health through optimal diets. The project, Variation in oral sensation and dietary risk of cardiovascular disease and obesity, revealed that genetic differences in the perception of food and beverage tastes/flavors influence what people like to eat and chose to eat. Ultimately, food perception and tastes influence whether or not people will follow dietary patterns that promote health and decrease the risk of chronic diseases such as obesity and cardiovascular disease (CVD). Study results have been translated to improve health through optimal diets related to variation in chemosensory function and food preference to lower cardiovascular disease and cancer risk. Genetic markers for dietary risk of chronic diseases such as obesity, cardiovascular disease, cancer and alcoholism have been identified. This study provided 480 hours of research experience for undergraduate students and study results were presented

at 5 professional conferences.

2. Brief description of the target audience

Families and youth with limited resources; state agency personnel and policy makers, teachers, food service staff, camp personnel, health personnel, researchers, nutritional sciences communities. National and international nutritional science communities, individuals concerned with healthy diets, students in health and nutrition fields of study.

3. How was eXtension used?

eXtension was consulted as a reference in handling phone calls and internet inquiries. It was also cited as a resource at workshops and programs for those with access to the internet. In addition, eXtension was used to announce news and events.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	5510	13000	4911	8050

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	2	32	34

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Face to face general group education sessions (workshops, etc)

Year	Actual
2011	3457

Output #2

Output Measure

- New or updated web page(s)

Year	Actual
2011	12

Output #3

Output Measure

- Individual consultations (in person, e-mail, etc.)

Year	Actual
2011	7035

Output #4

Output Measure

- Training Conferences or sessions hosted or conducted

Year	Actual
2011	455

Output #5

Output Measure

- Fact sheets, bulletins and newsletters written or edited.

Year	Actual
2011	29

Output #6

Output Measure

- Training of Undergraduate and Graduate Students

Year	Actual
2011	33

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased understanding (%) of the principles of good nutrition for families and children.
2	Increased use (%)of fruits and vegetables.
3	Decreased consumption (%) of high sugar foods.
4	Decreased consumption (%) of high fat foods.
5	Increased understanding of basic metabolic processes related to obesity, weight and health. (new research findings)
6	Educate immigrants on the dangers of obesity

Outcome #1

1. Outcome Measures

Increased understanding (%) of the principles of good nutrition for families and children.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4911

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Research shows income inequality has negative impacts on health, opportunity, and quality of life. Children who grow up in poverty have poorer health, higher rates of learning disabilities and developmental delays, and poorer school achievement. During these difficult economic times, Connecticut has seen a huge increase in the numbers of families with children using soup kitchens and food assistance making nutrition education a vital component of feeding the family.

What has been done
4-H Fitness and Nutrition Clubs were formulated from intervention sites for the Sustainable Communities Project. 4-H Summer and Year Round Nutrition Education Programs (4-H SYNEP) were conducted during summer lunch programs and at community centers. Those programs include 4-H Fitness and Nutrition (FANS) as well as working with a Children, Youth and Families at Risk grant bringing children and their families together through urban gardening projects. Programs attempted to intersect with EFNEP and SNAP-Ed which maximized participation and outreach efforts.

Results
Twelve teens were recruited and trained as youth facilitators for 4-H SYNEP. Four youth continued in a year-round program to deliver nutrition and fitness education via 4-H FANs as well as overlapping into SNAP nutrition education programs. Twenty-two programs/agencies (ie, day summer camps, farmers markets) were reached and a total of 3,837 nutrition contacts were achieved through program delivery. Thirty-two family nights comprised of nutrition and fitness programming were conducted at four community sites, and Exergame Olympics (Wii) resulted in 1,074 additional contacts. Total contacts achieved were 4,911. Teen facilitators were surveyed for knowledge of nutrition, fitness, and food safety. Forty-three non-profit organizations increased awareness of 4-H as a result of these projects.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Increased use (%)of fruits and vegetables.

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Decreased consumption (%) of high sugar foods.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Decreased consumption (%) of high fat foods.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Increased understanding of basic metabolic processes related to obesity, weight and health. (new research findings)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	158

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The "Healthy People Data Trends Progress Review" has reported that trends are worsening for several objectives; adults and children continue to grow more obese and consumption of fruits, vegetables and whole grains has not increased significantly. Dietary factors are associated with 4 out of 10 leading causes of death: coronary heart disease, various cancers, stroke and Type 2 Diabetes. In addition, the prevalence of high blood pressure and osteoporosis also have strong relationships to diet.

What has been done
Participants gained knowledge/awareness in physical activity choices and nutrition by the use of nontraditional exercise such as karate and dance. Youth also participated in food demonstrations and tasted healthy snacks. Nutrition education handouts were provided to youth and their families. Children were able to bring recipes and snack ideas home to their parents. A newsletter focusing on food and fitness tips was provided to all. Youth were also introduced to educational food and fitness websites using laptop computers.

Results
In New Haven, 158 youth participated in general nutrition and fitness programs at 22 sites. Survey results indicated that these programs improved the confidence and numbers of children passing the Connecticut Standard Fitness Tests. Findings illustrated that physical flexibility and the number of sit-ups completed per minute were two of the CT standard fitness test variables that significantly improved. Results also indicated that childrens attitudes towards eating and drinking healthy choices were improved. The implication is programmatic efforts designed to enhance positive attitudes toward healthy food and exercise in children will contribute positively to the fight against childhood obesity and other illnesses related to unhealthy diets and sedentary lifestyles.

4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #6

1. Outcome Measures

Educate immigrants on the dangers of obesity

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	50

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Obesity kills more Americans each year than AIDS, cancer, and injuries combined; and after smoking, it is the second-leading cause of preventable death in the United States. Medical costs attributable to obesity account for more than 9% of all the United States health expenditures. These numbers can escalate further as immigrant populations struggle to increase income and healthy eating habits that can follow these income issues.

What has been done
To address obesity among Hispanics, 22 adults, ages 18-45, formed a formal soccer team. They met twice a week to practice soccer, and twice a month for a game. Before practice they engaged in a 10 minute nutrition tips conversation. They learned about healthy foods and healthy eating, especially those that would help them become better athletes. Topics included: adding fruits and vegetables to their diets, reducing salt,sugar, and fats, consuming carbohydrates, and avoiding muscle cramps by increasing our bodys hydration.

Results
As a result of improving eating habits and being more conscious of what foods they consumed, the group of 22 adult men all reported weight loss, increased mobility and healthier lifestyles. The women in that community have come forward wanting to form the same type of nutrition and fitness program as their spouses!

4. Associated Knowledge Areas

KA Code	Knowledge Area

702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Lack of large or chain supermarket in cities)

Brief Explanation

The economy is the largest and most significant factor affecting childhood obesity. Reduced food assistance programs, access to affordable, nutritious foods, and cultural food differences are factors in achieving the ultimate goal of healthy children of appropriate weight. Many cities lack a traditional and essential component of their community - a large or chain supermarket. Urban residents often lack access to straightforward transportation to different urban neighborhoods or to outlying communities to access larger food hubs which make shopping and access to appropriate food choices convenient.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Through a variety of evaluation tools including pre-testing, time series and post- testing, Extension Educators surveyed participants utilizing both written and internet based methods. Clicker technology was also used as an avenue to judge responses during programs. In all situations, program participants felt comfortable making use of materials presented, and when technology was readily available, accessing information from the web. Participants also reported changes in attitude following completion of programs and felt they would make their new found knowledge a permanent change. For detailed results see the State Defined outcomes section.

Key Items of Evaluation

Activities that engaged continual evaluation and feedback from participants and stakeholders were motivating factors in obtaining desired feedback. Team leaders were asked to review processes for educational value to ensure planned programs were being followed and that programs remained significant and relevant in their focus.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Global Food Security and Hunger

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	4%		7%	
202	Plant Genetic Resources	4%		4%	
205	Plant Management Systems	21%		11%	
206	Basic Plant Biology	4%		0%	
216	Integrated Pest Management Systems	4%		0%	
301	Reproductive Performance of Animals	0%		7%	
303	Genetic Improvement of Animals	0%		4%	
304	Animal Genome	0%		4%	
305	Animal Physiological Processes	4%		12%	
306	Environmental Stress in Animals	5%		4%	
307	Animal Management Systems	8%		4%	
315	Animal Welfare/Well-Being and Protection	4%		4%	
403	Waste Disposal, Recycling, and Reuse	4%		0%	
503	Quality Maintenance in Storing and Marketing Food Products	0%		4%	
601	Economics of Agricultural Production and Farm Management	13%		11%	
602	Business Management, Finance, and Taxation	8%		4%	
604	Marketing and Distribution Practices	4%		0%	
605	Natural Resource and Environmental Economics	4%		11%	
607	Consumer Economics	8%		9%	
704	Nutrition and Hunger in the Population	1%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Extension	Research

Year: 2011	1862	1890	1862	1890
Plan	14.0	0.0	30.0	0.0
Actual Paid Professional	11.7	0.0	9.6	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**
480816	0	335878	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
480816	0	335878	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
144749	0	847707	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Extension partnered with other State agencies and organizations to reach farmers and producers with farm management strategies, particularly business practices, marketing and production strategies, through workshops and individual consultations. In addition, conferences, displays at conferences, meetings and social events, web page updates and webinars were held to facilitate the growth and expansion of the food industry both in and outside the state, and implement programs to conserve the natural resources of Connecticut.

Formula funds provided resources for 18 research projects. These projects funded the training of 35 graduate students through research projects designed to improve understanding, gain knowledge and adopt new practices in a variety of areas to enhance agricultural production and improve our capacity to meet food demand, and address food security. In addition, 32 peer reviewed publications were generated.

Research highlights included:

The multistate research project, Enhancing the Competitiveness and Value of U.S. Beef, provided results that suggested lactate, succinate, and pyruvate play a role in mitochondrial oxygen consumption and metmyoglobin reduction which affects meat color and quality. In addition, studies provided a better understanding of the role of mitochondria in myoglobin redox stability. This knowledge can be applied to new ingredient-based technologies, particularly injection-enhancement of case-ready beef products.

A Multistate research project, Optimization of Poultry Welfare and Production Systems for the 21stCentury, designed a pilot study to determine the effect of LED lamps vs CFL lamps on egg production and feed consumption. This was facilitated by comparing alternative energy efficient lighting within each cage of caged laying hens with traditional ceiling mounted lamps in the aisle between cage rows. This

study concluded that poultry producers could reduce energy use, provide the proper wavelength, intensity and duration of lighting to maintain production and improve bird welfare and promote efficient production with the modern enriched caged systems. As a result of this project many poultry farmers are replacing their current lamps with energy efficient LED or CFL lamps.

A multistate research project, Management systems to improve the economic and environmental sustainability of dairy enterprises, conducted studies to estimate the average technical efficiency (TE) for Florida and Georgia dairy farms with and without controlling for climatic conditions. Studies found that heat stress in dairy production absorbs a significant portion of the deficit milk production which could have otherwise been attributed to inefficiency. The study model indicated that a combined fan-sprinkling cooling mechanism is effective in reducing the impact of heat stress. A farmer can gain an average of 963lb (5%) more milk per cow per year with a fan-sprinkling system. Extension activities will communicate the economic feasibility of this adaptation strategy to farmers.

2. Brief description of the target audience

Agencies and organizations dealing with the food supply.
Researchers, and the scientific community
Fisheries stakeholders and managers, fisherman and processors, boat owners
Consumers
Producers
CT Department of Agriculture, other state and local policy makers
CT Farmland Trust, American Farmland Trust, CT Farm Bureau, CT Working Lands Alliance

3. How was eXtension used?

eXtension was used as a reference when handling phone calls and internet inquiries. It was also cited as a resource at workshops and programs for those with access to the internet. In addition, eXtension was used to announce news and events.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	13519	601442	0	25

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

Year: 2011
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	12	32	44

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Face to face general group education sessions (workshops, etc.)

Year	Actual
2011	2277

Output #2

Output Measure

- New or updated web page(s)

Year	Actual
2011	18

Output #3

Output Measure

- Individual consultations (in person, via e-mail, etc.)

Year	Actual
2011	4011

Output #4

Output Measure

- Training conferences or sessions hosted or conducted.

Year	Actual
2011	63

Output #5

Output Measure

- Fact sheets, bulletins and newsletters written or edited.

Year	Actual
2011	244

Output #6

Output Measure

- Training of Undergraduate and Graduate Students

Year	Actual
2011	50

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased adoption (%) of recommended BMP by growers or producers.
2	New understanding of animal growth processes developed.
3	Increased understanding (%) of food management practices by consumers.
4	Adoption of recommended food management practices by consumers.
5	Increased understanding of leasing farmland
6	Increased Integrated Pest Management knowledge

Outcome #1

1. Outcome Measures

Increased adoption (%) of recommended BMP by growers or producers.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Research indicates that soils can become saturated with phosphorus (P) and this can lead to P runoff into streams. P concentrations in streams at the parts per billion level, increase algae blooms and eutrophication of surface water. Farmers are under increasing pressure to protect the environment. Best Management Practices (BMP) are needed by farmers to improve their operations and avoid polluting the environment.

What has been done
Research indicates soils can become saturated with phosphorus (P) and this can lead to P runoff into streams. P concentrations in streams at the parts per billion level, increase algae blooms and eutrophication of surface water. Farmers are under increasing pressure to protect the environment. Best Management Practices (BMP) are reviewed and then implemented by farmers to improve their operations and avoid polluting the environment.

Results
Six thousand nine hundred eighty six tons of solid manure and more than 17 million gallons of liquid manure were applied according to the management plans on 6,201 acres of cropland. Farms spent $25,730 hauling manure, 11,194 miles ($2.30 per mile). Sixty-nine percent of crop fields exceeded yield goals even with extreme heat in summer and extremely wet conditions in spring and fall. The permit application for the first farm in CT to compost source separated organics from a grocery store was written by a CES educator and approved by CT DEEP. The farm is receiving 0.5 to 2 cubic yards of food waste from 2 grocery stores on a weekly schedule. The compost will all be used to support the production of vegetables and forage on the mixed

livestock and vegetable farm.

4. Associated Knowledge Areas

KA Code	Knowledge Area
305	Animal Physiological Processes
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation

Outcome #2

1. Outcome Measures

New understanding of animal growth processes developed.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	99

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Farmers of small ruminant animals produce meat, dairy, and fiber products. Due to overuse of chemical de-wormers, internal parasites have developed genetic resistance. Poor animal performance and even death may result.

What has been done
Workshops and one-on-one consultations with producers were conducted to take samples of manure and educate farmers about the presence of the barber pole worm (Haemonchus contortus). These tests were done by culturing the fecal samples at Virginia Tech, in sheep and goats. Resistance by the barber pole worm to chemical de-wormers averaged 23%, with a range of 0% to 70% resistance on different farms with different de-wormers tested.

Results
Sheep and goat producers in Connecticut were trained and used the FAMACHA color coded card to evaluate degree of anemia before using chemical de-wormers. Ninety-nine diagnostic tests

were conducted with 18 producers. They learned to score the body condition of their animals which is an indicator of parasitic infection.

4. Associated Knowledge Areas

KA Code	Knowledge Area
305	Animal Physiological Processes
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection

Outcome #3

1. Outcome Measures

Increased understanding (%) of food management practices by consumers.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Adoption of recommended food management practices by consumers.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Increased understanding of leasing farmland

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	150

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Farmland leasing and farmland access - This project focused on increasing the availability of leasable agriculture land by publishing a new educational guide, Farmland ConneCTions, to help municipalities and land trusts understand BMPs associated with both legal and practical considerations involved in leasing municipally owned farmland

What has been done
The Farmland ConneCTions guide included multiple components, including one concerned with Sustainable Agriculture Methods. The target audience of the guide was towns, institutions, and land trusts interested in leasing land for agricultural use. The publication formed the basis of outreach programs that consisted of webinars, conference workshops, presentations to land trusts and towns, as well as one-on-one direct service to farmers.

Results
The Farmland ConneCTions guide served as a model for a regional task force through the Land Access Project. A multistate task force is focused on creating new outreach materials for non-farming landowners, a category which includes land trusts and municipalities. Workshops reached 97 people and 8 municipalities and increased awareness and knowledge of farmland leasing.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
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
607	Consumer Economics

Outcome #6

1. Outcome Measures

Increased Integrated Pest Management knowledge

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual

2011	979

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The goal of integrated pest management (IPM) is to reduce the dependence of agricultural producers, homeowners and schools on pesticides while maintaining or improving productivity, crop quality and quality of life with regard to pest control. Since its inception in 1980, the University of Connecticut IPM program has made great strides in developing and implementing more sustainable methods for pest control throughout Connecticut.

What has been done
IPM training programs are conducted for vegetable, fruit, greenhouse, turfgrass, and nursery production. Information is also disseminated to growers through presentations, publications, pest information hotlines, and the IPM website found at www.ipm.uconn.edu. In addition, the Connecticut IPM program educates the public and natural area managers on issues related to invasive species.

Results
The general public benefitted from other program offerings such as conferences, web-based materials and special presentations. The University of Connecticut IPM Coordinator worked with IPM Educators to implement a team approach for addressing IPM on multiple commodities and settings in Connecticut such as fruits, vegetables, greenhouse crops, nurseries, landscapes and turfgrass. Nine hundred seventy nine people from farms, home owners, commodity groups, and legislators increased their knowledge of IPM.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
205	Plant Management Systems
206	Basic Plant Biology
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Competing Public priorities

Brief Explanation

The state of the economy is major factor in conducting programs. Extension seeks

cost recovery as allowed but producers have fewer resources to devote to farm management. Many government programs are operating at less than normal staffing and resources. That means that inspections, support and education are less than optimal.

Weather challenges resulting from record snowfall during the 2011 calendar year caused the collapse of many farm buildings, and created futher expense.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Through a variety of evaluation tools including pre-testing, time series and post- testing, Extension Educators surveyed participants utilizing both written and internet based methods. Clicker technology was also used as an avenue to judge responses during programs. In all situations, program participants felt comfortable making use of materials presented, and when technology was readily available, accessing information from the web. Participants also reported changes in attitude following completion of programs and felt they would make their new found knowledge a permanent change. For detailed results see the State Defined Outcomes section.

Key Items of Evaluation

Activities that engaged continual evaluation and feedback from participants and stakeholders were motivating factors in obtaining desired feedback. Team leaders were asked to review processes for educational value to ensure planned programs were being followed and that programs remained significant and relevant in their focus.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Family Youth and Communities

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
307	Animal Management Systems	17%		100%	
315	Animal Welfare/Well-Being and Protection	3%		0%	
703	Nutrition Education and Behavior	3%		0%	
724	Healthy Lifestyle	7%		0%	
801	Individual and Family Resource Management	10%		0%	
802	Human Development and Family Well-Being	7%		0%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	3%		0%	
806	Youth Development	50%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	21.0	0.0	1.0	0.0
Actual Paid Professional	18.9	0.0	0.1	0.0
Actual Volunteer	76.8	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**
622238	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
622238	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
615075	0	10826	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

UConn Extension focused its efforts on helping create places where children, teens and families will be safe, healthy, educated, socially and culturally aware, helping to encourage them to lead productive lives in their communities. Planned program activities included:

- Extension volunteer training programs
- 4-H Community club program- a long term commitment between adult volunteers and youth. The model of a youth working with an adult mentor over time is a proven methodology for making a significant impact on that young person's life.
- Independent membership - youth working with adult guidance
- Youth/adult partnerships, youth mentoring
- Workshops, project days, or short term programs that emphasize specific skill development
- School-enrichment programs
- After-school programs
- Youth employment programs
- Camps
- 4-H science-based programs offered at the 4-H education Center at Auerfarm
- Web-based educational resources/training programs

2. Brief description of the target audience

Youth and families, schools, youth serving agencies and organizations; community organizations and agencies.

3. How was eXtension used?

eXtension was used as a reference when handling phone calls and internet inquiries. It was also cited as a resource at workshops and programs for those with access to the internet. In addition, eXtension was used to announce news and events.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	35400	518925	11622	305486

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	17	0	17

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- New or updated webpage(s).

Year	Actual
2011	111

Output #2

Output Measure

- Volunteer training conferences or sessions hosted or conducted.

Year	Actual
2011	751

Output #3

Output Measure

- Fact sheets, bulletins and newsletters written or edited

Year	Actual

2011	135

Output #4

Output Measure

- After-school programs [sites] conducted or organized.

Year	Actual
2011	360

Output #5

Output Measure

- Training of Undergraduate and Graduate Students

Year	Actual
2011	26

Output #6

Output Measure

- Face-to-Face general group education sessions

Year	Actual
2011	673

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of 4-H sponsored community service projects completed by youth.
2	Number of youth indicating increased knowledge and skills in one or more of nine 4-H program emphasis areas.
3	Increased exploration of career opportunities by participating youth (number of youth)
4	Increased knowledge of leadership skills by adult volunteers working with youth (% change)
5	Increased new, active collaborative partnerships with other organizations, agencies, etc.
6	Number of consumers indicating new or confirmed knowledge of recommended consumer practices.
7	Number of youth participating in afterschool exercise programs

Outcome #1

1. Outcome Measures

Number of 4-H sponsored community service projects completed by youth.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	150

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Increasing teen leadership and citizenship knowledge is a priority area to growing community capacity. Older youth need to take part in planning, implementation and evaluation of programs in which they participate. These elements of the 4-H program contribute to a positive youth development and prevention model. Positive youth development is an intentional ongoing process in which youth try to meet their needs and develop competencies perceived as necessary for transition to adulthood.

What has been done
In one county alone, through a series of workshops, newsletters, fair association meetings (plan the county 4-H fair) and small group sessions, leadership activities and processes where implemented and carried out to encourage personal growth and increased comfort with group process and community service for the teens.

Results
Twenty-seven teen 4-H'ers increased skills and knowledge of program leadership as evidenced by willingness to successfully take on increasing responsibilities in managing and leading other youth in their clubs and/or as part of the 4-H Fair Officer team. In 10 clubs, teens reach local communities through community service projects. An estimated $5000 was given back to local communities in the form of cash donations, in kind services or donations of food & clothing, benefitting food banks, animal shelters, rabies clinics and other local assistance programs. Value of 4-H volunteers can be estimated by assuming 86 registered volunteers have given a minimum of 50 hours of service over the past year. Based on a national volunteer value of $23 per hour,

this translates into (86 x 50 x $23) $98,900.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
806	Youth Development

Outcome #2

1. Outcome Measures

Number of youth indicating increased knowledge and skills in one or more of nine 4-H program emphasis areas.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	150

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In CT, the income gap between the "haves" and "have nots" is the seventh highest in the country. According to Federal surveys, 2 cities CES works in are undeniably high-risk with disadvantage indices being 10. The range of the community disadvantage indices is 1-10 with 10 being the most disadvantaged. Overcrowded and unsafe school environments contribute to poor student achievement and high dropout rates. Although the state wide dropout rate is 6.6%, Bridgeport's averages 23.3%, and Waterbury's is 9.3%.

What has been done
Mentoring has illustrated youth increase their sense of purpose, have a chance to enhance life skills, get respect from a peer or caring adult, have an opportunity to contribute something to others and they like to share their knowledge. Best practices related to mentor recruitment, screening, training and monitoring are followed. Mentoring is conducted as a group or

individually. Partner agencies are trained in positive youth development and 4-H. PowerPoints are used in teaching youth development for partner's to use with mentors.

Results
The CT 4-H Mentoring Project is a 12 month mentoring program for 120 youth (30 mentors), in Bridgeport and Waterbury. Research shows that mentored youth are: more confident in their schoolwork, 52% less likely to skip school, 50% less likely to begin using illegal drugs, 33% less likely to begin using alcohol, 33% less likely to hit someone
Research shows mentoring provides health benefits in addition to social benefits. Health benefits include: lower mortality rates, greater functional ability, lower rates of depression later.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection
703	Nutrition Education and Behavior
724	Healthy Lifestyle
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
806	Youth Development

Outcome #3

1. Outcome Measures

Increased exploration of career opportunities by participating youth (number of youth)

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Increased knowledge of leadership skills by adult volunteers working with youth (% change)

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Increased new, active collaborative partnerships with other organizations, agencies, etc.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	320

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Our society views poor people as having weaknesses and deficiencies. We view them as having strengths. The People Empowering People (PEP) program was developed to build on the strengths and life experiences of natural leaders in communities. PEP is a life skills, leadership skills and civic engagement program. Through PEP, participants recognize their personal strengths, enhance and further develop leadership skills and knowledge and share these skills with their families and communities.

What has been done
PEP is a program of instruction and community service projects. Cooperative Extension trained agency staff and volunteers conduct the program in English or Spanish to parents, single adults, teen parents from community agencies and family resource centers. It also includes men and women from 6 prisons. In addition, women from two universities in Egypt visited May 2-6, 2011. They participated in two days of PEP facilitator training, met with collaborators facilitating the program in 3 cities, met with peer faculty.

Results
Ninty percent of 320 participants were able to state their values, recognized personal strengths and use "I" statements, 75% of improved their parent/family relationships, 45% of the CT community participants volunteered to assume a new leadership role, 90% of the CT community participants contributed 860 hours valued at $23,202.80, conducting 44 community projects impacting over 2000 people in their communities. Over 320 men and women graduated from community and prison PEP groups. 44% are Hispanic, 31% are Black/African American and over 70 % low income. 90% of the graduates were able to state their values, recognized personal strengths, and were able to use "I" statements. 75% improved parent/family relationships. 90% of the community participants engaged in community service projects.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
806	Youth Development

Outcome #6

1. Outcome Measures

Number of consumers indicating new or confirmed knowledge of recommended consumer practices.

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Number of youth participating in afterschool exercise programs

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	41

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Statistics have shown that children retain more when learning is combined with physical activity. Increased activity leads to improved health.

What has been done
At a faith based after school program, extension Educators and teen volunteers offered homework help. For 45 minutes three times a week, a fitness and technology program was conducted. After completing homework, participants engaged in organized physical activities including volley ball and indoor soccer. To involve parents, two of three family nights were

planned where parents and children played recreational games and enjoyed a delicious meal. The third family night included childrens presentations of their science projects.

Results

The target audience was 11 children (7 boys and 4 girls) from 6 to 11 years old who participate in after school programming. An additional 30 people were involved in through family participation with the children. There were two areas of impact identified at the conclusion of this after school program: a) Children got used to doing physical activities after completing their school homework and b) the Church's institutional capacity increased. Parents reported that while doing homework at home, children had learned to set aside time to play some of the games they learned when completing their studies.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Competing Programmatic Challenges
- Other (Competiting activities)

Brief Explanation

Reduced funding affected our ability to offer programs consistently throughout the state. Inability to replace staff that retired affected our programs. Economic conditions impacted the number of volunteers for the 4-H programs. In addition, youth have many opportunities for non-school activities that compete with traditional 4-H club activities and this affects the participation in our programs.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Through a variety of evaluation tools including pre-testing, time series and post- testing, Extension Educators surveyed participants utilizing both written and internet based methods. Clicker technology was also used as an avenue to judge responses during programs. In all situations, program participants felt comfortable making use of materials presented, and when technology was readily available, accessing information from the web. Participants also reported changes in attitude following completion of programs and felt they would make their new found knowledge a permanent change. For detailed results see

the State Defined Outcomes section.

Key Items of Evaluation

Activities that engaged continual evaluation and feedback from participants and stakeholders were motivating factors in obtaining desired feedback. Team leaders were asked to review processes for educational value to ensure planned programs were being followed and that programs remained significant and relevant in their focus.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Sustainable Energy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
104	Protect Soil from Harmful Effects of Natural Elements	0%		25%	
123	Management and Sustainability of Forest Resources	0%		25%	
125	Agroforestry	100%		25%	
511	New and Improved Non-Food Products and Processes	0%		25%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Actual Paid Professional	0.1	0.0	0.5	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	45281	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	45281	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
3594	0	26156	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Sustainable energy is a relatively new and growing planned program in Connecticut. Extension efforts are underway to educate stakeholders about prompt conservation and efficient use of energy in agriculture as part of farm and risk management, and in homes as a component of family financial management.

Formulas funds supported 3 research projects contributing to the development of biomass used for biofuels and production of value-added bio-based industrial products. These research projects generated 2 peer-reviewed publications and trained 2 graduate students in sustainable energy research.

Research projects included:
A Hatch research project investigated cost-effective renewable energy strategies.
A Hatch research project studied Willow (Salix) as a renewable feedstock for bioenergy.
A Hatch Multistate research project investigated gene manipulation of plant hormone contents to develop characteristics and chemical composition that would make some woody plants more appropriate for bioenergy applications.

2. Brief description of the target audience

Federal and State agencies, local governments, power companies, Willow producers in New England, biofuel scientific community

3. How was eXtension used?

eXtension was used as a reference when handling phone calls and internet inquiries. It was also cited as a resource at workshops and programs for those with access to the internet. In addition, eXtension was used to announce news and events.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1240	6070	0	350

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

Year: 2011
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	2	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Face-to-face (general Education Sessions

Year	Actual
2011	9

Output #2

Output Measure

- Web pages new or updated

Year	Actual
2011	3

Output #3

Output Measure

- Training of Undergraduate and Graduate Students

Year	Actual
2011	2

Output #4

Output Measure

- Training conferences or sessions hosted or conducted

Year	Actual
2011	9

Output #5

Output Measure

- Individual Consultations

Year	Actual
2011	45

Output #6

Output Measure

- Fact Sheets, bulletins, newsletters, written or edited

Year	Actual
2011	14

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Cost effective renewable energy strategies
2	Willow as a renewable feedstock for bioenergy in the Northeast USA
3	Development of new technologies for genetic improvement of wood biomass materials for bioenergy applications

Outcome #1

1. Outcome Measures

Cost effective renewable energy strategies

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The consequence of relying on fossil fuels as a primary energy source is a global issue. A shift toward renewable, carbon-neutral energy sources will reduce our reliance on fossil fuels.

What has been done
Researchers developed a study to determine the potential of forest residue to offset coal use in co-fired coal power plants in the Northeastern United States. Geographic Information Systems (GIS) was used to estimate the potential quantity of coal that could be offset by forest residue in the northeastern United States and assess the energy benefits against the ecological and economic costs. Data collection and analysis is continuing.

Results
A protocol for calculating logging residue available per forest pixel was developed, that allows scientists to estimate the amount of forest residue that can be economically delivered to co-fired (coal and biomass) power plants in the study region of NY, PA, CT, VT, NH, ME, MA, RI, WV and VA.

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes

Outcome #2

1. Outcome Measures

Willow as a renewable feedstock for bioenergy in the Northeast USA

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The consequence of relying on fossil fuels as a primary energy source is a global issue. A shift toward renewable, carbon-neutral energy sources will reduce our reliance on fossil fuels.

What has been done
Researchers developed field experiments to determine the potential for growth of willow in northeastern soils and optimal willow yields in other regions of US. Willows (Salix) are fast-growing and can be grown in high density; they are a primary focus for potential as a renewable feedstock for bioenergy in the Northeast USA. Data was collected on qualitative and quantitative attributes of harvestable parts of shrub willow as influenced by variances in soil.

Results
Study results confirmed the suitability of Connecticut land for the production of willow biomass clones; established a protocol to evaluate the microsite effects on willow yields (planting and harvesting dates and methods, pest pressure predictions and timing for herbicide applications, crop establishment costs). This study was a critically important base for long-term research focused on optimization of local production systems and for predicting the best growing sites for energy plantations in Connecticut.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
125	Agroforestry

511 New and Improved Non-Food Products and Processes

Outcome #3

1. Outcome Measures

Development of new technologies for genetic improvement of wood biomass materials for bioenergy applications

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The consequence of relying on fossil fuels as a primary energy source is a global issue. A shift toward renewable, carbon-neutral energy sources will reduce our reliance on fossil fuels

What has been done
Transgenic poplar plants with altered hormone contents for use in wood plant species were developed. Genetic improvement of woody plants provides a powerful tool to reduce production costs of biofuels and bioproducts from woody biomass

Results
Study results suggested that manipulation of plant hormone contents in plants could lead to alterations in growth and development characteristics and chemical compositions of woody plants. Evaluation of the gene deletor technology provides a basis for field application of the technology. Further studies are underway to apply hormonal genes and the gene-deletor technology to bioenergy applications.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
511	New and Improved Non-Food Products and Processes

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities

Brief Explanation

The economy contributed the public and private interest in sustainable energy. Funding for research into alternative energy sources is scarce. Available credit for loans for business and farm changes to sustainable energy products affects outcomes.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Reseach study evaluations were conducted as needed.

Key Items of Evaluation

Reseach study evaluations were conducted to benefit study designs.