

2010 University of Connecticut - Storrs Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

As the land-grant university in Connecticut, the University of Connecticut has served the people of Connecticut since its founding as the Storrs Agricultural School in 1881, in Storrs. Today, as one of 14 colleges and schools within the University, the College of Agriculture and Natural Resources serves Connecticut through a wide variety of research, outreach education, and undergraduate and graduate degree programs. The College provides high-quality, broad-based, relevant educational opportunities that prepare graduates to address the challenges of life today; it expands the frontiers of knowledge through research; and it enhances economic opportunities and quality of life for people of Connecticut and beyond.

The Storrs Agricultural Experiment Station centers its work on basic and applied research focused on topics critical to the state, the nation and the world. Cooperative Extension faculty and staff, working with a network of trained volunteers and eight Extension councils, conduct research-based educational programs throughout the state. A key component of Extension programs is training volunteers who become trainers themselves, leveraging the financial investment in the Connecticut Cooperative Extension System.

The College maintains livestock facilities, greenhouses, forested lands, gardens, and other operations for teaching, research, outreach education, and service programs. The College is supported by federal and state appropriations, extramural and intramural grants and contracts, and contributions from the private sector.

For the reporting period, the College of Agriculture and Natural Resources' research mission comprised 14% of the total Storrs campus research expenditures or \$174,000 in grant/contract expenditures per faculty member at the Storrs campus. Scholarly productivity was strong with journal publications, books, book chapters and abstracts. The Connecticut Veterinary Medical Diagnostic Laboratory annually examined 1300 animals and conducted 130,000 diagnostic tests. In addition, the research effort contributed substantially to human capacity development in the agricultural sciences through its training of more than 225 graduate students and post-doctoral scientists.

The Home and Garden Education Center received more than 10,000 requests for information, published a bi-weekly column viewed by 250,000 residents in print and online, linking gardening, environmental issues and current research. The Soil Testing Laboratory processed 17,000 samples for both the agricultural industry and the home gardener. The popular Dairy Bar, a unit of the Department of Animal Science, supported teaching, outreach and research, and continued its production of high quality, locally sourced dairy products for the public, thus showcasing an important component of Connecticut agriculture.

Via the Center for Land Use Education and Research (CLEAR), 500 town and state officials were trained in geospatial technology, with 5,000 people accessing web tools monthly for both residential and municipal purposes. Non-point Education for Municipal Officials (NEMO) Education has conducted workshops on the impact of land use on natural resources in 75% of Connecticut's 169 cities and towns, and has become a model educational program emulated in 30 states.

Food Stamp Nutrition Education (SNAP-Ed) provided Nutrition education to 3,000 food stamp eligible citizens, and was matched dollar for dollar by the federal government. During the past year, the Master Gardener program trained 200 citizens to answer gardening and related questions in their local counties or communities. The network of Master Gardeners provided 10,000 hours of community service in transferring and applying research based information to everyday environmental concerns of citizens.

The 4-H youth development program reached 25,000 participating youth through club, community and school partnership programs. "Epiphany", a model, volunteer-driven mentoring program for ex-offenders, worked through faith-based communities, to enable incarcerated individuals to successfully transition back to their communities. Operation Military Kids, a program for youth with deployed parents, provided education at several military bases in the state.

Other recent highlights of the College of Agriculture and Natural Resources included significant undergraduate growth (applications for fall 2011 admission are up 38% over one year ago), and two new academic efforts: an Agricultural Biotechnology minor and Environmental Sciences program. A Food and Health Initiative is being directed toward fundamental and applied studies of the efficacy of bioactive components in foods and the diet. New international programs in Florence, Italy, and in Beijing and Chengdu, China, are focused on undergraduate studies in sustainability and research, respectively.

Among the growing number of collaborations with state and municipal governments is a major urban gardening initiative in Bridgeport, the state's largest city. CT Eco (Environmental Conditions Online) is a new effort, providing maps and geospatial data for planning, management and research in an interactive web format. It offers a variety of tools for sharing natural resource and environmental information, such as water resources, soils, open space, geology and aerial imagery for better decision making in and for Connecticut.

At the Center of Excellence for Vaccine Research, studies of animal diseases have had an impact on public health in the Connecticut region. For example, vaccines and diagnostic tools have been developed to identify and treat diseases affecting poultry, cattle, and swine to improve the agricultural economy as well as enhance the retail food industry. A study involving avian circoviruses resulted in the successful cloning and sequencing of pigeon circovirus DNA, a necessary step to guard the health of commercial duck, geese and game bird industries in Connecticut.

The turf grass industry in Connecticut has a major financial impact on the state's economy. Additionally, managing turf grass correctly impacts the aesthetic quality of landscape, the environment and the safety of adults and children utilizing athletic fields across the state. Thus, a traditional agricultural effort becomes part of a public health strategy.

Objectives: 1) support all three major facets of the turf grass industry- golf, sports/commercial, and residential by providing continuing education 2) communicate the latest research findings to the turf grass industry and to the public, and 3) be accessible to help solve turf grass and soil related problems.

As an example, all lawn care pesticide use at public and private schools (grades pre-K through 8th) in Connecticut has been banned, effective July 1, 2010. This includes all athletic fields. While many organic products have shown their effectiveness when used as part of a comprehensive turf grass management program, their exclusive use as part of an "organic" approach to athletic field management and effect on playing surface quality has not been significantly researched. This knowledge gap has left many parks/recreation and athletic field managers with many questions related to managing these turf grass areas effectively with no chemical controls for pests (weeds, insects and diseases). Research was initiated in 2008 to assess the effect of organic management practices on turf grass quality and playing surface characteristics (i.e. traction and surface hardness) when compared to more traditional management

practices (i.e. synthetic fertilizers and pesticides) and an untreated control.

Results from this research indicated where turf grass managers should focus management resources given the restrictions outlined by this law. Results have been presented at various seminars in Connecticut, Rhode Island, and New Jersey and two workshops were done in partnership with the Connecticut Department of Environmental Protection to train practitioners on how to manage turf grass most effectively without the use of pesticides. In addition, the researcher served on an Ad Hoc Stakeholder/CT DEP Committee that discussed potential modifications to the law.

Research into the hepatoprotective activities of green tea on obesity-triggered Non-Alcoholic Fatty Liver Disease (NAFLD) has shown that green tea extract reduced inflammation and hepatic injury as well as decreased dietary lipid absorption. With 70 million Americans affected by NAFLD, this finding is of major importance.

Faculty and students involved with studies of mastitis resistance to improve dairy food quality and safety examined antibiotic residue screening tests for the detection of natural antimicrobials. The outcome of this work will lead to reduced application of antibiotics in dairy cows, concomitant with a reduction in the prevalence of mastitis within dairy herds that adopt the studied practice of ultrasound to target specific antibiotic treatment.

Given the amount of coast line as well as inland waterways in Connecticut, towns are challenged to protect these natural resources. As municipalities, non-profits, and local land trusts acquire and legally protect properties from further development, stewardship and management responsibilities arise. Development pressures from surrounding properties, invasive species, climate change, and fragmentation are among the challenges that can adversely affect the sustainability of protected lands. Stewards find it challenging to identify what activities to allow, assess the key natural or cultural resources, and determine which management or restoration actions are highest priorities. By providing a habitat based management plan outline, land stewards have a template with which to develop a management plan. Also, once a plan is developed, these groups have a greater ability to apply for funding to accomplish prioritized management goals. Connecticut Sea Grant developed a habitat-based management plan outline as a new tool for land trust stewards and town open space managers to support the long-term conservation and management of open space in Connecticut. The outline provides a framework for the documentation of background information and a methodology to determine management actions, based on habitat, needed for the long term conservation of a particular site. More than 240 land trust and town commission members are now trained in the use of the tool and its application to the management of specific habitats. Following the training, three land trusts and one conservation commission have to date incorporated all or aspects of the outline into management plans for land parcels. The Essex (CT) land trust was awarded NRCS WHIP cost share funds to implement habitat management on one of its preserves. The program is conducted in cooperation with The Nature Conservancy, and USFWS.

A recently published study entitled, "The Economic Impacts of Connecticut's Agricultural Industry", has demonstrated the significant contribution of agriculture to the state and region. Despite being the third smallest state in the U.S., agriculture in Connecticut continues to thrive, with 405,616 acres in farmland, or 13% of the total land area (forests, wetland, and water comprise over 50%). Connecticut agriculture ranked third in New England, with sales at \$551 million in 2007. The average farm size is 82 acres. Sales of forest products accounted for \$131.5 million in 2007, and for the same year, sales of primary agricultural processing sectors (fluid milk and butter, fruit and vegetable canning, wineries, meat processing, ice cream, cheese, and seafood) were \$955 million. Using several different models, the study concluded that the total output impact is between \$2.72 and \$3.51 billion in 2007, with an average of \$3.09 billion. In the same year, the total gross State product was \$212 billion. On a per capita basis, the agricultural industry generates approximately \$1,000 per Connecticut resident. In addition, 16,650-22,753 jobs are generated from agricultural efforts, and approximately \$1-1.7 billion in value-added products. The

study has been widely disseminated, and has improved both the public's and the legislature's view of the value of agriculture in an urban state.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	67.0	0.0	58.0	0.0
Actual	84.0	0.0	68.0	0.0

II. Merit Review Process

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

- Combined External and Internal University Panel
- 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 the peer institutions, and a review by stakeholders.

The new 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 subjects every project to a rigorous and systematic evaluation for appropriateness and quality. The process was conducted within the framework of predetermined criteria whose objective is 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 provides principal investigator with additional counsel on research direction and implementation. Department Heads oversee the peer review process and suggest qualified reviewers. The Director of the Storrs AES/the Associate Dean approved projects once they had been critically reviewed and endorsed by the Department Head.

Note: In the following section, FTE numbers differ from planned numbers, most likely because initial

plans counted faculty and professional staff differently. The increase is not a result of new hires.

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
- Targeted invitation to non-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, and 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 increasing 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
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Survey specifically with non-traditional individuals

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 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
2142874	0	1143493	0

2. Totaled Actual dollars from Planned Programs Inputs				
Extension			Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	1849481	0	632076	0
Actual Matching	1849481	0	632076	0
Actual All Other	2603372	0	6292588	0
Total Actual Expended	6302334	0	7556740	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	381125	0	536219	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Childhood Obesity: Human Nutrition and Health
2	Global Food Security and Hunger: Economics Marketing and Policy
3	Family Youth and Communities
4	Climate Change: Forestry and Wildlife
5	Climate Change: Land Use
6	Global Food Security and Hunger: Plant Production
7	Food Safety: Plant Protection
8	Climate Change: Water and Weather
9	Global Food Security: Animal Production
10	Food Safety: Animal Protection

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Childhood Obesity: Human Nutrition and Health

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
702	Requirements and Function of Nutrients and Other Food Components	10%		65%	
703	Nutrition Education and Behavior	70%		15%	
704	Nutrition and Hunger in the Population	15%		10%	
724	Healthy Lifestyle	5%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	12.0	0.0	10.0	0.0
Actual	14.2	0.0	13.0	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
508178	0	176775	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
508178	0	176775	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	1020897	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Educational workshops
 Reserch projects
 Participation on policy councils
 Individual consultations
 Publications
 Websites

2. Brief description of the target audience

Limited income families
 Policy makers
 Children

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	5500	14000	130	550
Actual	6000	13500	450	600

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

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	3	5	
Actual	3	17	20

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2010	55	17000

Output #2

Output Measure

- Websites developed

Year	Target	Actual
2010	2	4

Output #3

Output Measure

- Media releases

Year	Target	Actual
2010	23	45

Output #4

Output Measure

- Books and monographs

Year	Target	Actual
2010	5	6

Output #5

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2010	3	225

Output #6

Output Measure

- Presentations and short courses

Year	Target	Actual
2010	65	300

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Understanding of basic dietary processes vis-a-vis nutrition and/or health
2	Public policy adoption of health management strategies (# of strategies adopted)
3	Reduced (%) levels of obesity by target populations

Outcome #1

1. Outcome Measures

Understanding of basic dietary processes vis-a-vis nutrition and/or health

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Non-alcoholic Fatty Liver Disease (NAFLD) is estimated to affect 70 million Americans and is expected to increase due to the obesity epidemic affecting two-thirds of Americans. Experimental evidence indicates that green tea or its catechins regulate body weight and decrease dietary lipid absorption. This study has explored the extent to which green tea extract (GTE) protects against NAFLD.

What has been done

We conducted a GTE intervention study in rodents in which rats were fed a low fat diet containing no GTE or were fed a high fat diet with varying amounts of GTE for 8 weeks. We then examined whether GTE decreased hepatic adipose inflammation, restored tissue glutathione redox status and attenuated liver injury in this experimental model of dietary-induced NAFLD.

Results

GTE decreased high fat induced inflammation and hepatic injury in NAFLD by altering tissue glutathione (GSH) redox status. Additional study is underway to define the anti-inflammatory mechanisms by which GTE protects against NAFLD.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Public policy adoption of health management strategies (# of strategies adopted)

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Advertising of high calorie, high fat and sugar foods, such as candy, is a significant influence on what young children eat, particularly when the advertising medium is 'children directed programs' on television. Food preferences are formed early in childhood; eating candy can contribute to obesity and diabetics among children.

What has been done

The object of the project was to understand how advertising directed to children affects food preferences and choices of Hispanic children. Using proprietary data sets from the Nielsen Company and the Food Marketing and Policy Center at the University of Connecticut, we investigated whether the Children's Food and Beverage Advertising Initiative (CFBAI) initiated in 2006 to change the advertising mix of food and beverage products - specifically, three candy firms - Mars, Hershey, and Cadbury-Adams, pledged to stop advertising to children under 12 on TV several years later.

Results

Based on analysis, there was no significant impact on consumption by Hispanic children under 12. The lack of reduction in children's exposure to candy advertising revealed an important loophole in the CFBAI guideline. The guideline defined children-directed programs as those with more than 50% of viewers being under 12. Two problems - use of a percentage rather than actual numbers, and the fact that the advertising occurs on programs such as American Idol, where there may be large numbers of young viewers, but meeting the percentage threshold. Thus, self-regulation may not be the answer to reducing candy advertising directed to children. Whether a public policy is the answer remains to be seen.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #3

1. Outcome Measures

Reduced (%) levels of obesity by target populations

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	1160

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Individuals of economic disadvantage are a great risk for many physiological and psychological problems because of unhealthy diets and food insecurity. Adults and children who lack sufficient food quality and nutrition are more likely to be obese, have chronic health problems such as diabetes and heart diseases, and are less productive citizens with less ability to glean full advantage of school and opportunities for advancement. CT Department of Health and other sources report that one in four (26%) Connecticut high school students are obese (12.3%) or overweight (13.3%) (2007 Youth Risk Behavior Survey) Adolescents who are overweight have an estimated 80 % chance of being obese as adults. One in eight (12%) Connecticut children ages 10-17 are obese, according to a 2003-2004 survey of parents. Among low-income children ages 2-5 in Connecticut, 16% are obese (2006 data).

What has been done

Hands on, interactive workshops with families and youth focused on basic nutrition, food preparation practices, as well as healthy snacks, and food resource management. Collaboration with over 100 community based agencies and organizations ranging from food pantries, shelters, health centers, WIC clinics, neighborhood centers, etc. resulted in reaching high priority low income audiences.

Results

In one program state-wide, 70% of participants showed improvement in at least one and 43% improved in two or more food resource practices and similar percentages showed improvement in nutrition practices. In another program, 45% of children were documented to have improved

growth parameters such as less incidence of overweight/obesity as a result of workshops focusing on nutrition and feeding the family. 95% of parents (320) who attended nutrition workshops were able to make positive food choices for their children to lessen the risk of overweight/obesity.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The economy, particularly job loss, is a major influence.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Time series (multiple points before and after program)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Global Food Security and Hunger: Economics Marketing and Policy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
602	Business Management, Finance, and Taxation	80%		40%	
603	Market Economics	20%		50%	
606	International Trade and Development	0%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	4.0	0.0
Actual	3.1	0.0	6.6	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
80473	0	36677	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
80473	0	36677	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
303024	0	461548	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research studies
Workshops

Conferences
 Individual Consultations
 Business Guide written

2. Brief description of the target audience

Agricultural producers
 Agricultural service providers
 State agency personnel
 Commodity organizations

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	600	1500	0	0
Actual	2100	43300	50	2500

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

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	0	4	
Actual	1	8	9

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Web sites developed

Year	Target	Actual
2010	1	4

Output #2

Output Measure

- Media articles

Year	Target	Actual
2010	3	10

Output #3

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2010	5	17

Output #4

Output Measure

- Presentations and short courses

Year	Target	Actual
2010	15	12

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2010	0	8

Output #6

Output Measure

- Conference abstracts
- Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2010	5	10

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Natural resource management policies adopted and/or amended at national, state, regional and local governmental levels
2	Number of new and/or strengthened partnerships with governmental agencies, NGOs and/or corporations resulting from research and Extension programmatic activities in the area of economics, marketing and policy
3	Acreage under crop insurance (% increase)
4	Adoption of recommended risk management strategies by defined target audience (% of audience)
5	New food policies adopted/amended at the national, state, regional and/or local level by governmental, non-profit and or corporate entities related to pricing, local buying, distribution and availability

Outcome #1

1. Outcome Measures

Natural resource management policies adopted and/or amended at national, state, regional and local governmental levels

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Number of new and/or strengthened partnerships with governmental agencies, NGOs and/or corporations resulting from research and Extension programmatic activities in the area of economics, marketing and policy

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agriculture and related natural resources such as forestry have been undervalued in a state such as Connecticut that is often categorized as urban. Policy makers and funders needed accurate information on which to make decisions about the state's economic health and what contributes to it. Because the agricultural industry purchases goods and services from other industries and hires local labor, its economic importance cascades throughout the states economy beyond the visible segments of farms and direct marketing of farm products.

What has been done

A comprehensive study of the total economic impact of agriculture through three economic models was conducted. The agricultural industry was defined as encompassing crop and livestock production, forest products and the processing of the state's agricultural production. Twenty associations of stateholders provided input as well as financial resources. The results were widely disseminated through the media, the website, and printing of the report. The Governor's office, the legislature and the Congressional delegation and stakeholders of the agricultural industries in the state were briefed on the results.

Results

The analysis revealed that the total impact of the agricultural industries in the state's economy was up to \$3.5 billion, with 20,000 jobs generated. In addition, the industry was found to contribute significant social benefits and ecosystem services. Qualitative outcomes include: (1) raising awareness of the importance of the agricultural industry for the economy and jobs; (2) provide bedrock information about the different subsectors that comprise the agricultural industry in the state; (3) clarify and define agriculture in the state; (4) galvanize the partnership between the University of Connecticut (College of Agriculture and Natural Resources) and stakeholders and policy makers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
603	Market Economics

Outcome #3

1. Outcome Measures

Acreage under crop insurance (% increase)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As part of a risk management plan, agricultural producers need to understand how crop insurance can be an important strategy. Despite limitations on what crop insurance is available in Connecticut, farmers need information on current crop insurance programs available, how to apply, what records are needed, etc. Crop insurance helps farmers cover loses due to weather, natural disasters, etc. In tight economic times, such loses have major implications for farm viability.

What has been done

Information on crop insurance programs, deadlines, eligibility, etc. were provided by postal mail and the web, as well as through face to face programs. Extension educators reached producers

through presentations and staffed exhibits at most commodity or farm association meetings in the state. Three farm tours included current information on crop insurance. Farm risk management counseling sessions reached 54 farm families.

Results

There has been a slight but steady gain in the number of farms considering and/or applying for crop insurance. This is due to the certain crops being eligible for crop insurance in ONLY a limited number of counties - often not the counties with the largest acreage of a crop. However, farmers report having the information on which to make a decision on crop insurance, if it is available.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
603	Market Economics

Outcome #4

1. Outcome Measures

Adoption of recommended risk management strategies by defined target audience (% of audience)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Risk management is essential for farms in today's economy. In Connecticut, with high taxes, labor and land costs, managing other risks is essential to the bottom line. Risks include: human resources, production, legal, financial and marketing. Many farmers are not aware of the risks that they may be incurring.

What has been done

Through workshops, exhibits, on-farm tours, a comprehensive website, direct mail, and one-on-one advising sessions conducted by agricultural business professionals, Extension educators stressed the importance of addressing farm risk. Collaborative efforts with many traditional and non-traditional farm organizations enabled Extension educators to reach a large segment of the

agricultural community.

Results

Evaluations showed that farm producers and their families were more knowledgeable about estate planning, farm transfer, transition to organic production, crop insurance, new marketing strategies, dealing with local officials, as well as converting to different production/markets.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
603	Market Economics

Outcome #5

1. Outcome Measures

New food policies adopted/amended at the national, state, regional and/or local level by governmental, non-profit and or corporate entities related to pricing, local buying, distribution and availability

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The permitting process has been identified as the primary constraint to new development and expansion of the aquaculture industry in Connecticut. Efforts to streamline the application and review process has the potential to improve the viability of aquaculture in the state. Aquaculture contributes not only the state's economy as a product, but also is a component of the tourism industry and provides jobs.

What has been done

A University of Connecticut Extension faculty member chaired the Connecticut Aquaculture Permitting Workgroup, comprised of the CT Dept. of Environmental Protection, US Army Corp of Engineers and the CT Dept. of Agriculture. The workgroup identified ways to improve and

streamline the permitting process.

Results

A new permitting process for low impact marine aquaculture projects is being implemented. It drastically reduced paperwork and time from 12 to 6 months. This is a cost savings for both aquaculture producers and local, state and federal resource managers. An outline and technical content were created for a website directed to aquaculture producers and resource managers by UConn faculty, is operating under the auspices of the National Oceanic and Atmospheric Administration National Marine Fisheries Service Aquaculture Program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
603	Market Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- Time series (multiple points before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 3

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
801	Individual and Family Resource Management	10%		0%	
802	Human Development and Family Well-Being	5%		100%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	5%		0%	
806	Youth Development	80%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	17.0	0.0	2.0	0.0
Actual	33.8	0.0	0.6	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
453624	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
453624	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
792003	0	36758	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Extension programs, camps, workshops, 4-H clubs, School-enrichment programs, web-based educational programs.

2. Brief description of the target audience

Youth, schools and families.
 Communities
 Community organizations

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	4000	1500	24000	3500
Actual	4200	1890	25000	4800

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

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	4	1	
Actual	4	1	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Presentations and short courses

Year	Target	Actual
2010	80	100

Output #2

Output Measure

- Websites developed

Year	Target	Actual
2010	1	5

Output #3

Output Measure

- Curricula Developed

Year	Target	Actual
2010	1	2

Output #4

Output Measure

- Media Contacts

Year	Target	Actual
2010	25	30

Output #5

Output Measure

- Newsletters and marketing materials

Year	Target	Actual
2010	15	20

Output #6

Output Measure

- After-school programs

Year	Target	Actual
2010	5	191

Output #7

Output Measure

- eXtension committee participation

Year	Target	Actual
2010	1	1

Output #8

Output Measure

- Books and monographs

Year	Target	Actual
2010	0	0

Output #9

Output Measure

- Conference abstracts

Year	Target	Actual
2010	1	0

Output #10

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2010	2	80

Output #11

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2010	10	20

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Participation in community service projects by youth and/or adults participating in program efforts (% of total defined audience)
2	Increased knowledge and skills in one or more of nine 4-H program emphasis areas by participating youth (% change)
3	Increased exploration of career opportunities by participating youth (% change)
4	Increased awareness and/or adoption of leadership knowledge and skills by adult volunteers working with youth (% change)
5	Increased endowment of 4-H Centennial account (\$)
6	Increased awareness of value of 4-H to Connecticut by targeted segment of general public (% change)
7	Increased awareness by non-profit organizations of 4-H value (% increase) as defined by new and/or enhanced partnerships, grant funding, publicity, referrals
8	Improved healthy home environments for children through interagency partnerships.

Outcome #1

1. Outcome Measures

Participation in community service projects by youth and/or adults participating in program efforts
(% of total defined audience)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Citizen participation and the development of social capital are two current community development concerns/trends, which depend on volunteer efforts in neighborhoods and communities. Learning about citizenship through such participation instills in youth a sense of giving back to the community, and enables them to learn about responsibilities of citizenship.

What has been done

4-H clubs and individual members participate in at least one community service project annually. In the course of a year, one county 4-H program reported that 1000 hours of volunteer time by youth were contributed to a variety of community efforts. In another county, over 2000 hours of time were contributed, with over 1300 youth involved. Youth prepared baskets for the homeless at Thanksgiving, raised funds for the Wounded Warrior project and Heifer International, collected mittens, hats and personal supplies for a homeless shelter, prepared boxes for soldiers, assisted at animal shelters and many other activities.

Results

Results included improved understanding of community needs, improved skills in organizing projects and more positive attitudes toward community efforts and citizenship responsibilities in general. Teens also learned to work collaboratively with younger youth and adults. Also teens the skills needed to take on leadership roles.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Increased knowledge and skills in one or more of nine 4-H program emphasis areas by participating youth (% change)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	20	40

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Youth in the United States are considered to be lacking in science and math skills. Such skills are essential to future success in work and family life. 4-H programs and school-taught knowledge reinforce that learning, engage youth proactively, and enable youth apply that knowledge to practice.

What has been done

The 4-H robotics program targets inner city youth at 3 different sites in Hartford. A pilot national 4-H robotics/science curriculum was used in the after school effort. Youth participated in 'junk drawer robotics' as well as built mini-bots using the NXT LEGO robotics platform. Workshops were held in other locations including the Teen Conference on the UConn campus. A traditional 4-H animal science project, Beef, also involves youth in science & math related activities through skil-a-thon, fitting and showing classes, beef cattle judging, record keeping, and carcass evaluation. Giving oral reasons during judging and interviews also provides career related skills.

Results

There are now 5 high school 4-H Robotic clubs that are competitive and 7 clubs that are non-competitive. Youth increased their problem solving and collaborative work skills; learned scientific terms and the scientific method; learned about career options such as engineering, CAD design and computer programming. Some indication that girls increased confidence in science efforts. Youth in the beef project increased awareness and adoption of leadership skills, as well as explored career opportunities as a result of participation on the regional (New England) level. Specifically, they demonstrated knowledge of feed and equipment identification, parts of an animal, meat identification, hay evaluation and problem solving relating to quality assurance criteria.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Increased exploration of career opportunities by participating youth (% change)

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Increased awareness and/or adoption of leadership knowledge and skills by adult volunteers working with youth (% change)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	20	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code **Knowledge Area**
806 Youth Development

Outcome #5

1. Outcome Measures

Increased endowment of 4-H Centennial account (\$)

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Increased awareness of value of 4-H to Connecticut by targeted segment of general public (% change)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15	100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Youth of military personnel in Connecticut can feel isolated due to the fact that most of the 10,094 military children are geographically dispersed, rather than being affiliated with a local military installation. During the deployment of a family member, youth have additional emotional, physical, social and academic needs. Reducing the sense of isolation through community support is the focus.

What has been done

Operation Military Kids in Connecticut is a partnership of the University of Connecticut Cooperative Extension, with 2-1-1 Child Care; American Legion, Army One-Source, Boys and Girls Club, Coast Guard Academy Child Development Center, Red Cross, National Guard, Navy Sub Base NLON Child & Youth Program, YMCA, Army Reserve, etc. Workshops that taught community groups about the emotional impact of deployment on military children; Hero Packs were backpacks created by civilian youth groups with items to help them stay in touch w/deployed parents; and a mobile tech lab that partners can utilize at military youth events for events and

communicating with deployed parents were among the projects done. Websites have created a continuing resource.

Results

Over 6800 community members (100%) increased their awareness of Operation Military Kids and the 4-H/University of Connecticut connection. Nearly all military families in Connecticut were reached through cooperation with Army/Air National Guard, Navy, Coast Guard and Army Reserves. Twenty people were trained to operate the mobile technology lab. In addition to a Department of Defense/UDSA grant, nearly \$5000 in local funding has been donated.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #7

1. Outcome Measures

Increased awareness by non-profit organizations of 4-H value (% increase) as defined by new and/or enhanced partnerships, grant funding, publicity, referrals

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15	18

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

No organization can be everything to everyone. Collaboration is essential for successful youth programs in the community. 4-H continues to involve many community organizations in reaching youth throughout Connecticut

What has been done

From inner city programming to rural communities, 4-H faculty and staff have involved: Wal-mart, CT Beardsley Zoo, local senior centers, elementary schools, fair associations, Easter Seals, Goodwill, Family Resource Centers, Area Cooperative Educational Services, magnet schools, etc. Staff and volunteers from these businesses, schools and organizations provide leadership, funding, recruitment, and a myriad of other functions to help youth actively participate in 4-H and 4-H sponsored learning activities.

Results

As result, 4-H is perceived as a pro-active, learner and community centered youth development program, supported by the University of Connecticut.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #8

1. Outcome Measures

Improved healthy home environments for children through interagency partnerships.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the Surgeon General's 2009 Call to Action, research shows that healthy homes lead to healthier lives. Among the challenges: second hand smoke, carbon monoxide, house fires, falls, exposure to mold and damp exacerbate asthma (est. \$3.5 billion in health care costs), radon and lead exposure. All are susceptible; however, residents of

What has been done

Expanding on relationships built during previous lead poisoning prevention programs, the Extension Healthy Environments for Children Initiative (HEC) has expanded to include eliminating asthma triggers in the home, controlling pests safely, preventing lead poisoning, reducing hazardous clutter, and the use of dangerous chemicals. Train the trainer programs, teacher education, and developing an on-line version of the training, along with curriculums and related publications have been the primary outputs.

Results

Over 150 teachers and 9 trainers were trained about lead poisoning prevention; and 2018 children learned about lead at 75 schools and Head Start programs; an animated video on lead had 1518 views on YouTube and won 2nd prize nationally for public service announcements; a

technical review of the National Center for Healthy Housing online lead awareness training for paint retailers; a posters and homeowner information in English and Spanish about hiring lead contractors. Results are evidenced by the widespread/national use of the materials created in CT. These include: Invited by EPA Region I to cosponsor Lead Coordinating Committee's annual conference; video has been cited on websites ranging from National Lead Safe Contractor Association, to Vermont Department of Health; lead awareness booklet for Native American children recommended by the National Library of Medicine, the City of San Diego and the Wampanoag Tribe, etc.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Competing Programmatic Challenges

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Case Study
- Other (Project reports)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Climate Change: Forestry and Wildlife

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources	70%		60%	
124	Urban Forestry	20%		30%	
135	Aquatic and Terrestrial Wildlife	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	2.0	0.0
Actual	1.5	0.0	1.6	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
67977	0	210999	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
67977	0	210999	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
60857	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct workshops
 Create/update webpages

Organize conferences
 Provide training for local officials

2. Brief description of the target audience

Municipal officials
 Community volunteers
 Citizens
 State officials and policy makers

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	3000	6000	0	0
Actual	2800	5000	0	0

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

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	1	
Actual	2	3	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2010	5	12

Output #2

Output Measure

- Short courses
Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Websites developed

Year	Target	Actual
2010	1	3

Output #4

Output Measure

- Books and monographs

Year	Target	Actual
2010	0	8

Output #5

Output Measure

- Conference abstracts
Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2010	2	35

Output #7

Output Measure

- Presentations and short courses

Year	Target	Actual
2010	45	40

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of governmental and/or private sector entities utilizing GIS approaches resulting - in part - from research and/or Extension programming
2	Number of qualified tree wardens appointed/reappointed by municipalities
3	Municipal Shade Tree Ordinances developed and/or revised
4	Stewardship Plans Developed
5	Increased understanding of fish and wildlife population patterns and/or behavior (# of patterns and/or behaviors)

Outcome #1

1. Outcome Measures

Number of governmental and/or private sector entities utilizing GIS approaches resulting - in part - from research and/or Extension programming

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	20	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Geospatial technologies geographic information systems, (GIS) remote sensing, global positioning systems (GPS), and internet technologies are immensely powerful tools for individuals, communities, and Land and Sea Grant researchers and outreach professions. The use of these technologies for local land use planning, university outreach and research will provide a wide variety of benefits to these endeavors.

What has been done

The Geospatial Training Program (GTP), a program of CANR's Center for Land Use Education and Research (CLEAR), conducted regular training on GIS, GPS and related technologies for CT residents that included community officials, agency staff, fellow academicians, and professionals in the land use planning and environmental sectors. In addition, GTP faculty, supported by a competitive grant from the USDA/NIFA Water Program, conduct selected workshops across the nation for Land and Sea Grant water resource faculty interested in learning new GIS-internet fusion ?mashup? technology that can help them conduct their research and/or outreach programs.

Results

Over 300 officials and others learned about GIS technologies and how it can be used in decision-making. With help from the Connecticut Sea Grant Program and the Connecticut Department of Agriculture, Bureau of Aquaculture, the University of Connecticut Center for Land Use Education and Research (CLEAR) has developed an interactive online map viewer to provide municipal shellfish commissions with the tools, such as GIS, and information necessary to make informed decision regarding the siting of shellfisheries in their town.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
124	Urban Forestry
135	Aquatic and Terrestrial Wildlife

Outcome #2

1. Outcome Measures

Number of qualified tree wardens appointed/reappointed by municipalities

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	110

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Every municipality (169) in Connecticut is required by law to appoint a tree warden. The tree warden then has care and control over all municipal trees in their community. Tree wardens must have knowledge and skills in urban forestry, arboriculture, public policy, and the human dimensions of their work. The Connecticut Tree Warden School provides new knowledge to tree wardens to improve their ability to perform their work.

What has been done

: Tree Wardens Association of Connecticut, Inc.; Connecticut Urban In collaboration with the Forest Council, Inc.; Connecticut Department of Environmental Protection, Division of Forestry; Connecticut Agricultural Experiment Station; and the private company, Bartlett Tree Experts, 21 tree wardens, deputy tree wardens, municipal engineers participated in the 12th (2010) annual Tree Warden School.

Results

Over 65% of municipalities in Connecticut appointed a tree warden. One of the non-tangible aspects of many Connecticut towns is the 'New England' look - old homes, wide streets, and beautiful trees that contributes to tourism, and thus the local economy. Severe winters in Connecticut over the past several years have impacted trees - those towns with tree wardens are more likely to have programs to replace damaged trees with those better adapted to the 21st

century environment. Those passing the final course exam and continue to obtain required continuation education credits to maintain certification.

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry

Outcome #3

1. Outcome Measures

Municipal Shade Tree Ordinances developed and/or revised

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As noted previously, beautiful trees are essential to the expected "New England" look which contributes to tourism. Maintaining and replacing trees in cities and towns under constant development pressure requires appropriate local ordinances.

What has been done

Model ordinances, local official training through the tree warden schools, and consultations provide municipalities with information on which to make policy.

Results

Two towns developed or revised their municipal Shade Tree Ordinances.

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry

Outcome #4

1. Outcome Measures

Stewardship Plans Developed

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The forest resource in Connecticut is increasingly parcelized and fragmented, compromising the myriad public benefits forests provide for all citizens. Forests serve many functions, including carbon sequestration, value-added products such as wood, as well as intangibles such as recreation, wildlife habitat, and tourism value.

What has been done

Through partnerships with the state Dept. of Environmental Protection (Forstery Division), the USDA forstest Service, USDA Natural Resources Conservation Service and the CT Agricultural Experiement Station, presentations were made on the value, issues and strategics to maintain and improve Connecticut private woodlands. Audiences included the woodland owners, local officials, and state and federal partners. Students were involved through service-learning projects.

Results

Stewardship plans were developed by private landowners. Management plans were also developed for and by individuals enrolled in farmland protection programs. Results show enhanced water quality, carbon sequestration; improved biodiversity, increased rural economic activity, and enhanced woodland owner satisfaction. An estimated 900 acres of woodland were addressed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
135	Aquatic and Terrestrial Wildlife

Outcome #5

1. Outcome Measures

Increased understanding of fish and wildlife population patterns and/or behavior (# of patterns and/or behaviors)

Not Reporting on this Outcome Measure

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 and staffing changes were external factors.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Climate Change: Land Use

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
131	Alternative Uses of Land	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	9.0	0.0	7.0	0.0
Actual	6.9	0.0	6.3	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
218218	0	17233	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
218218	0	17233	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
141278	0	641028	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

workshops
web pages
consultations

2010	10	10
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Output #2

Output Measure

- Web sites developed

Year	Target	Actual
2010	0	6

Output #3

Output Measure

- Presentations and short courses

Year	Target	Actual
2010	60	69

Output #4

Output Measure

- News releases and media appearances

Year	Target	Actual
2010	15	16

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2010	0	1

Output #6

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2010	2	25

Output #7

Output Measure

- Conference abstracts
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Requests and/or use of developed land cover data by governmental and/or private sector entities
2	Adoption and/or revision of recommended land use public policies by governmental entities
3	Acres of land permanently protected and managed

Outcome #1

1. Outcome Measures

Requests and/or use of developed land cover data by governmental and/or private sector entities

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	35	11000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Connecticut's Changing Landscape (CCL) is an ongoing research project that uses remote sensing technology to track land cover change in Connecticut. The project periodically updates its data, but the current project cover the 21-year time period 1985-2006. CCL is a project of the CANR Center for Land Use Education and Research (CLEAR), and as with all CLEAR projects strives for full integration of research, geospatial tools and training, and Extension outreach. CCL studies now include overall land cover change, forest fragmentation, land cover change in riparian corridors, and land cover change over prime and important agricultural soils. Such information is essential for good decision making at the local level. Visual data allows local officials, businesses and citizens to make informed land use decisions as they undertake various planning projects for their city or town. The CCL project allows policy makers at the state, regional and local levels to view, quantify and understand the outcomes of past land use practices, and thus inform future land use policies and decisions.

What has been done

The results of these studies are disseminated over extensive websites that deliver key information in ways ranging from simple PDF maps to charts and figures to interactive mapping to data download. In addition, Extension faculty present this information to various agencies, organizations and communities via traditional Extension workshops. The primary audience for this project is CLEAR's target audience of local (municipal) land use officials. The "Your Town" section of the CCL website, where local officials can download maps, data tables and charts for their individual town on demand, is among the most frequently used of all the many CLEAR sites, averaging over 1200 unique visitors per month. CCL information has been incorporated into many town Comprehensive Plans and community Resource Inventories. CCL data is also used extensively by fellow researchers, state agency natural resource managers, and nonprofit groups. At UConn, Civil Engineering, Plant Science and Landscape Architecture, and Ecology and

Evolutionary Biology Departments have all made use of CCL data. The state Plan of Conservation and Development also references the study.

Results

The CT Office of Policy and Management has incorporated CCL data into the Connecticut State Plan of Conservation and Development. The Long Island Sound Study National Estuary Program, a collaboration of two regions of the EPA and the states of NY and CT, is working with CLEAR to expand the CCL to include the NY portions of the Long Island Sound watershed, as a way to track certain land cover metrics relevant to achieving regional water resource health goals. The Working Lands Alliance has used CCL data to make the case for increased effort in the state on farmland preservation. The CT Department of Environmental Protection has used CCL-derived impervious cover data to conduct statewide research on watershed health, from which has come a nationally precedent-setting water regulation. At the town level, the CCL has been incorporated into comprehensive and open space plans, and/or regulations helping to catalyze land and farmland protection efforts in 13 communities across the state.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

Outcome #2

1. Outcome Measures

Adoption and/or revision of recommended land use public policies by governmental entities

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	20	33

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There is no county government in Connecticut; thus small towns often lack full time planning and zoning staff and/or professional staff who address community planning, design and conservation. Citizen boards, in conjunction with town meetings, are the decision makers about the future of

their communities. Access to model regulations, strategic planning tools, and related expertise, enable volunteer citizen boards to make informed decisions about land use, thus enabling them to better sustain their character, quality of life, environment and economy.

What has been done

The Green Valley Institute (GVI) has developed an educational approach to addressing land use issues. GVI provides land use commissioners and landowners with workshops, seminars and technical assistance to promote sustainable development patterns and protect natural resources. Communities have incorporated new concepts into comprehensive plans, developed new regulations and protected land, as a result.

GVI asks communities what they need to make better land use decision through program evaluations and periodic needs assessment surveys. In 2010, GVI conducted an electronic needs assessment survey to identify concerns of decision-makers and landowners. This survey received a response rate similar to previously mailed surveys for a fraction of the cost.

In 2009/2010, GVI worked with the Town of Chaplin facilitating a series of visioning sessions to kick off the update of their Plan of Conservation and Development and led a team through the POCD development process.

During this same period, GVI worked with stakeholders in the larger Natchaug River Watershed. Previously, GVI had led the group through a Conservation Action Planning Process. They are now implementing recommendations of that process, including a community compact and a dashboard manual for public works employees.

GVI also partnered with the Orton Family Foundation, the Nature Conservancy and others, for Phase II of the Borderlands Village Innovation Pilot Project. In this phase, the towns of Killingly, CT and Exeter, RI worked with GVI to refine and implement their visions (developed in Phase I). GVI also conducted research and developed a summary report about innovative regulatory tools designed to focus new development and protect natural resources. This research is available on line and will be presented throughout the region.

Results

GVI, along with TNC and local stakeholders in eight Natchaug River Basin towns, are implementing regional strategies and measurable actions for the protection of high water quality for the plants, animals and people of the largest drinking water supply watershed in Connecticut. Individual subcommittees are developing programs for education and outreach, land use issues and best management practices for road construction and maintenance. GVI was awarded a \$6500 grant from the CT Environmental Review Team for the design and production of a Dashboard Manual to identify tools and options for municipal and state transportation departments in the Natchaug River Basin and beyond. In June 2010, the town of Chaplin adopted a new POCD and they are now working to implement the plan.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

Outcome #3

1. Outcome Measures

Acres of land permanently protected and managed

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3500	1431

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Green Valley Institute addresses land use issues in The Last Green Valley, including those relating to community planning, design and conservation. This work is important because rural communities in New England often lack the tools and information they need to adequately address these issues and they have very limited professional assistance. Through better land use decision making, communities will be better able to sustain their character and quality of life, as well as the surrounding environment.

What has been done

GVI staff held numerous individual meetings with private landowners and interested citizens in FY2010 as well as a Family Land Protection workshop with over 64 participants in attendance representing over 800 acres of land. The GVI staff conducted 130 consultations, developed several manuals, incorporated GIS tools into programs for local officials, and trained volunteers.

Results

GVI efforts contributed to at least 1,431 acres of additional land that is now in the process of, or has been permanently protected. These additional acres bring the total since 2001 to at least 9,583 acres of undeveloped land permanently protected from development, as a direct result of landowners attending programs and workshops or working directly with GVI staff to identify protection options.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

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 continues to be a challenge for many towns in CT, particularly those with little tax base beyond residential. Land-use decisions are often influenced by the potential for addition revenue from taxes, either from residential or commercial use of remaining open space and /or forests.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Case Study

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)**Program # 6****1. Name of the Planned Program**

Global Food Security and Hunger: Plant Production

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	50%		10%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		40%	
202	Plant Genetic Resources	0%		10%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		30%	
205	Plant Management Systems	50%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	10.0	0.0
Actual	7.1	0.0	9.6	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
230736	0	23994	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
230736	0	23994	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
233034	0	1044080	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Workshops
 Conferences
 Basic and Applied Research
 Webpages
 Collaborations with state and federal agencies, grower groups, and agricultural organizations

2. Brief description of the target audience

Commerical farmers/producers
 Agricultural service providers

 Home owners and gardeners

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	3000	12000	0	0
Actual	4200	10000	0	0

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

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	2	5	
Actual	3	2	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Fact sheets, brochures and newsletters

Year	Target	Actual
2010	35	30

Output #2

Output Measure

- Web sites developed

Year	Target	Actual
2010	1	3

Output #3

Output Measure

- Presentations and short courses

Year	Target	Actual
2010	50	145

Output #4

Output Measure

- News releases and media events

Year	Target	Actual
2010	40	48

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2010	1	2

Output #6

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2010	4	8

Output #7

Output Measure

- Conference abstracts

Year	Target	Actual
2010	1	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Adoption of recommended BMP approaches by defined targeted industry and growers (% of participating entities)
2	Awareness of recommended BMP approaches by defined participating industry and growers (% of participating entities)
3	Understanding of basic plant production processes (#)

Outcome #1

1. Outcome Measures

Adoption of recommended BMP approaches by defined targeted industry and growers (% of participating entities)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	25	40

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Sustainability issues related to greenhouse crop production and marketing are critical for agricultural businesses to be profitable. These issues include business competitiveness, business management, marketing, labor management, greenhouse systems, greenhouse structures, energy conservation, crop production practices, pest management, nutrient management, regulations and compliance, and others.

What has been done

In cooperation with public and private partners, the Northeast Greenhouse Conference (a biennial 2-day conference and trade show with an average total attendance of 1400) was planned and implemented, and the New England Greenhouse Floriculture Guide (a management guide for insects, diseases, weeds, and growth regulators) that provides best management practices (BMPs) for ornamental crop production was developed and published.

Southern New England partners collaborated on a SARE funded project to develop the Greenhouse & High Tunnel Tomato Production conference) and to provide technical training, recommendations & diagnostic services to growers using a variety of tools including on-line outreach services through the New England Greenhouse Update website. The website includes a searchable photo library and a blog that allows participation from Extension educators in different geographic areas to easily post timely updates. (See http://www.negreenhouseupdate.info/greenhouse_update/index.php).

Other collaborations were the Evening in the Greenhouse? series, the 2-day winter educational meeting and trade show, and hands-on workshops such as the 2010 Plant Diagnostic Clinic. UConn and Connecticut Agriculture Experiment Station scientists collaborated with Geremia Greenhouses Inc. to develop irrigation methods that reduces root-borne disease and reliance on

plant growth regulators and fungicides while conserving water and nutrients compared to traditional overhead irrigation.

The ornamental plant extension team planned and sponsored the Perennial Plant Conference, the Garden Conference and the pesticide applicators recertification series Winter Bedding Plant meetings. Crop production schedules and BMPs are updated annually as required and soil test interpretation, crop production diagnostics and cultural advice are provided regularly.

Results

Growers in CT are increasingly adopting more sustainable production practices. These include increased use of nutrient and water containment systems in crop production, increased reliance on beneficial organisms (predators and parasites) to control pests, improved diagnostic skills to detect and respond to cultural problems quickly and in accordance with current BMPs, and improved energy conservation practices.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Awareness of recommended BMP approaches by defined participating industry and growers (% of participating entities)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15	55

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Connecticut farmers use greenhouses to grow potted herbs, vegetable bedding plants, tomatoes, annual and perennial flowering plants (from both seed and cuttings), and potted holiday crops. Greenhouse-grown plants are sold to consumers for planting in gardens or landscapes and for use in mixed planters, hanging baskets or for indoor use. Greenhouse vegetables and herbs are sold retail at farmers markets and roadside stand, and wholesale to restaurants and through other markets.

Many farmers in southern New England have added greenhouse crops to their businesses to increase income. Greenhouse and nursery crops comprise more than one-third of all cash receipts received by agricultural producers. Bedding plants and garden plants are the largest sales category. In Connecticut, the greenhouse industry is a significant part of the environmental horticulture industry (production, retail & landscape services) which is a major sector of Connecticut agriculture. The environmental horticulture industry provides many jobs (over 48,000 employed in CT), with plant sales generating over \$583 million. It also helps keep more than 46,000 acres in agriculture of which 23% is open space. Critical issues for farmers wishing to adopt sustainable greenhouse production are prevention of cultural and pest problems (which are increasing due to industry globalization and pest invasion), early diagnosis, and early intervention. More growers are interested in employing biological controls because chemical resistance is making it hard to control many common greenhouse pests. But, it is a very different strategy than conventional control with a different set of skills and knowledge needed. Suppliers and distributors are fighting for a share of this market. It is hard for growers to find reliable unbiased sources of information.

What has been done

Full season IPM hands on training sessions were held at participating growers' greenhouses. During visits, farmers learned how to use tools for early diagnosis, cultural practices to reduce pests and how to use low-risk pesticides and biological controls.

Weekly email updates (information gained from site visits mentioned above) were sent to 500 growers in southern New England with short abstracts, photos and links to additional information via the website (New England Greenhouse Update (www.negreenhouseupdate.info) which is a joint, multi-state effort between UMASS and UCONN.

Full season IPM hands on training sessions were held at the individual grower greenhouses. Fourteen businesses participated in the program directly impacting 14.15 acres (616,428 square feet) of intensive greenhouse production plus 10 acres of outdoor production. A total of 131 infield IPM training sessions were conducted. This sustainable greenhouse health maintenance program was able to provide unbiased information that helped growers to prevent problems and grow their greenhouse crops using sustainable practices and products.

Results

Full season IPM hands on training sessions were held at the individual grower greenhouses. Fourteen businesses participated in the program directly impacting 14.15 acres (616,428 square feet) of intensive greenhouse production plus 10 acres of outdoor production. A total of 131 infield IPM training sessions were conducted. This sustainable greenhouse health maintenance program was able to provide unbiased information that helped growers to prevent problems and grow their greenhouse crops using sustainable practices and products.

Pre and post season surveys were conducted to determine changes in pesticide use at

participating farms. All participants increased their adoption of Integrated Pest Management (IPM) practices. For the 14 participating businesses, insecticide use decreased as 14.7 pounds of insecticide active ingredient was saved from application. Crop losses were reduced, cultural practices were improved, and crop quality increased.

Whenever possible, farmers selected more environmentally friendly and or biologically based products with shorter reentry levels, lessening worker exposure to pesticides. Fifty percent of the businesses used biological control agents including beneficial nematodes, and/or predatory mites. Sixty six percent also reduced pesticide use.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Understanding of basic plant production processes (#)

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Certified organic growers are challenged by availability and effectiveness of organic fertilizers for greenhouse crops.

What has been done

A research project studied 'Nitrogen Nutrition for Energy Efficient and Certified Organic Cultivation of Greenhouse Crops'. Combinations of pre-plant incorporated and liquid fertilizers were evaluated in trials with tomatoes.

Results

Study results indicate that Phosphorous availability is a limiting factor for plant growth with some organic fertilizers. Furthermore, the fact that the sodium nitrate and potassium sulfate (NK) formulation was capable of producing plants equal to the K+ formulatin provides certified organic growers with a method of fertilization that avoids some significant disadvantages of commercial liquid organic fertilizers. Results support efforts to develop improved production procedures compliant with the National Organic Program (NOP) standards. Development of a new liquid fertilizer formulation using ingredients compliant with NOP standards will provide certified organic growers with a more convenient means of fertilizing plants

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The economy limits experimentation by growers.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Food Safety: Plant Protection

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	20%		0%	
212	Pathogens and Nematodes Affecting Plants	0%		50%	
215	Biological Control of Pests Affecting Plants	20%		30%	
216	Integrated Pest Management Systems	60%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	7.0	0.0	2.0	0.0
Actual	6.9	0.0	1.0	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
158322	0	10335	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
158322	0	10335	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
80638	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Workshops
 Training sessions
 Applied research
 Consultations
 Webpages

2. Brief description of the target audience

Growers
 Agricultural producers
 Agricultural workers.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	3000	14000	0	0
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	1	
Actual	6	1	7

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Websites developed

Year

Target

Actual

2010	1	5
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Output #2

Output Measure

- Presentations and short courses

Year	Target	Actual
2010	40	45

Output #3

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2010	30	37

Output #4

Output Measure

- Media contacts

Year	Target	Actual
2010	30	28

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2010	0	15

Output #6

Output Measure

- Conference abstracts

Year	Target	Actual
2010	1	1

Output #7

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2010	2	8

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased adoption (%) of recommended BMPs by targeted consumer populations
2	Increased adoption (%) of recommended BMPs by targeted grower populations
3	Pesticide use reduction (%) by participating growers
4	Increased certification (%) by pesticide applicators

Outcome #1

1. Outcome Measures

Increased adoption (%) of recommended BMPs by targeted consumer populations

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

Increased adoption (%) of recommended BMPs by targeted grower populations

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Reduced-tillage systems, such as deep zone tillage (DZT), help to minimize field preparation costs; reduce energy use; eliminate soil, nutrient and pesticide runoff; help restore soil health and fertility; provide farmers access to open space; reduce irrigation demands; and provide the ultimate climate change tool for a region that is forecast to become warmer and wetter. Deep zone tillage helps the soil retain moisture during dry conditions because the soil surface is protected by mulch, and allows plant roots to grow through the plow pan and fully explore the soil profile. In wet conditions, DZT helps prevent soil crusting which improves germination, prevents flooding in low wet areas which minimizes disease problems and increases productive ground, allows crops to be planted on time even in wet fields, and allows growers to avoid standing water when preparing ground for planting.

What has been done

This project consisted of a soil compaction and OM 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. In the past year, a total of 10 new farms converted to using DZT, and Extension Educators in all 6 New England states and beyond (i.e. Nova Scotia) helped in promoting the new reduced-till system.

Results

Ten commercial farms and three universities transitioned to deep zone tillage between July 2009 and June 2010, bringing the total number of DZT farms in New England to 15. Ten growers, (5%) of the folks who filled out an evaluation at the NEVFC, said that DZT was the best of 30 sessions and 11 said they would adopt DZT as a new practice. Twenty-two people said they would adopt DZT as a new practice after the CT Vegetable & Small Fruit Growers Conference.

Five DZT growers were surveyed at the end of the 2009 growing season. They all said they saved field preparation time, fuel, machine hours and maintenance time using DZT and improved their yields. One grower took the time to plow and harrow one square acre and DZT another, and measured the time it took and the fuel used. He reduced his field preparation time from 1.5 to 0.5 hours (67%) and his fuel consumption from 4.5 to 1.25 gallons (72%). He then constructed a hitch for his planter so that he could prepare the field and plant in a single pass and reduced his

time and fuel even more (83% and 78%, respectively). His measurements match results reported in the literature. DZT farmers have achieved savings between \$46 and \$56 per acre for fuel, labor and nitrogen alone. They all felt that they improved their yields in 2009 because of their ability to plant wet fields on time with the new system (in the wettest season on record). They also commented that there was an "increase in organic matter and general soil health" and that DZT was "alleviating compaction" and providing "much better drainage." One of the growers purchased a new no-till drill for planting cover crops to complete his conversion to reduced tillage. Two of these growers purchased or constructed a second DZT machine: one for bare-ground plantings and a second for crops planted on raised-beds. Ten commercial farms and three universities transitioned to deep zone tillage between July 2009 and June 2010, bringing the total number of DZT farms in New England to 15. Ten growers, (5%) of the folks who filled out an evaluation at the NEVFC, said that DZT was the best of 30 sessions and 11 said they would adopt DZT as a new practice. Twenty-two people said they would adopt DZT as a new practice after the CT Vegetable & Small Fruit Growers Conference.

Five DZT growers were surveyed at the end of the 2009 growing season. They all said they saved field preparation time, fuel, machine hours and maintenance time using DZT and improved their yields. One grower took the time to plow and harrow one square acre and DZT another, and measured the time it took and the fuel used. He reduced his field preparation time from 1.5 to 0.5 hours (67%) and his fuel consumption from 4.5 to 1.25 gallons (72%). He then constructed a hitch for his planter so that he could prepare the field and plant in a single pass and reduced his time and fuel even more (83% and 78%, respectively). His measurements match results reported in the literature. DZT farmers have achieved savings between \$46 and \$56 per acre for fuel, labor and nitrogen alone. They all felt that they improved their yields in 2009 because of their ability to plant wet fields on time with the new system (in the wettest season on record). They also commented that there was an "increase in organic matter and general soil health" and that DZT was "alleviating compaction" and providing "much better drainage." One of the growers purchased a new no-till drill for planting cover crops to complete his conversion to reduced tillage. Two of these growers purchased or constructed a second DZT machine: one for bare-ground plantings and a second for crops planted on raised-beds.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

Pesticide use reduction (%) by participating growers

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Integrated pest management (IPM) is the selection, integration, and implementation of pest control tactics based on predicted economic, ecological and sociological consequences. IPM combines the use of several tactics in a way that minimizes economic, health and environmental risks of pest management activities. IPM helps growers address pest problems in an environmentally-sound manner while maintaining or improving crop quality and quantity. In addition to addressing pest problems, adoption of IPM helps meet the increasing market demand for foods grown using sustainable practices and/or organic approaches. Many of the country's largest food distributors, such as SYSCO, are requiring their growers to adopt sustainable practices that include IPM. Many federal agencies recognize the value of IPM and NRCS is one such agency that can promote IPM adoption through its Environmental Quality Incentives Program (EQIP). Adoption of IPM practices can result in less pesticide runoff and leaching to groundwater, improved soil health, and protection of agricultural workers.

What has been done

IPM program extension educators provided on-site, season long training to 18 growers participating in the NRCS IPM training program that lasts 3 years for each grower. IPM training was provided in vegetable IPM, fruit IPM, IPM for greenhouse crops and wine grape IPM. Growers were trained in a number of IPM practices that included proper pest identification, scouting methods, use of thresholds, selection of low-toxicity pesticides, preventive approaches to pest problems, and use of biological control approaches. In addition, applied research projects were conducted for specific pests when more information is needed on monitoring, action thresholds or alternative control methods. A total of 13 fruit growers participated in on-farm IPM field training during the 2009 growing season, including careful scouting of pests and damage, use of pheromone traps and other monitoring traps, biological controls, cultural controls, mating disruption, proper selection of pesticides and the use of resistant cultivars. Weather stations were installed at six orchard locations to provide temperature, leaf wetness and rainfall data which were used to determine infection periods and forecasting for several major fruit diseases including apple scab, fire blight and sooty blotch/flyspeck disease complex. Applied research projects included mating disruption trials for currant borer and peachtree borers in several locations. Fruit IPM information was provided via E-Mail and web pest messages, and articles in the University of Connecticut Crop Talk newsletter. Faculty served on the steering committee for the Connecticut Pomological Society Annual meeting and twilight meetings and for the Connecticut Vegetable and Small Fruit Growers Conference, and made Fruit IPM presentations at these events. A faculty member was also the lead scientist in the development of the guidelines for the

Eco-Stone Fruit protocol in collaboration with the IPM Institute of North America and Red Tomato. The protocol is followed by growers who cooperate with Red Tomato, a non-profit organization which helps farmers sell their sustainably grown produce to supermarkets, distributors and other buyers.

Results

A total of 13 fruit growers participated in on-farm Integrated Pest Management (IPM) training programs during the 2009 growing season. All participants increased adoption of recommended IPM practices and all growers reduced pesticide use by an estimated 20%.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

Increased certification (%) by pesticide applicators

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	35

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The issue of using pesticides is controversial, and at the same time pesticides are an important tool used in pest management for public health, property protection and food production. The State of Connecticut requires that individuals using restricted-use pesticides on their own property or property which they rent for agricultural purposes become certified as private pesticide applicators. Individuals who hold themselves out for hire to apply any type of pesticides are required to be certified as commercial applicators. All applicators must maintain their certification by earning re-certification credit at educational programs. Each applicator must earn 12 educational credits in five years to qualify for recertification. One credit equals one hour of

instruction on pesticide safety education and pest management. The Pesticide Safety Education Program provides educational programs for recertification of private applicators and commercial applicators, and initial certification education for Ornamental and Turf and Golf Course Superintendent's commercial certification. Additionally, pesticide safety education is provided to commodity groups, the general public and Master Gardeners volunteers.

What has been done

The pesticide safety education program (PSEP) provided 18 workshops, seminars and demonstrations providing re-certification credits for all certified applicators to achieve the 12 hours of education credits necessary for recertification. The supervisory commercial ornamental and turf category represents the greatest number of commercial applicators in the state (48%). The demand for training in this category is great. The PSEP offers three formal short courses, or 16 sessions, to educate prospective applicants for certification in these categories. Other formal and informal programs about pesticide safety were presented to specific commodity/grower, green industry groups, Master Gardeners, and other groups and the general public.

Over 200 Master Gardeners were provided pesticide safety education through the Master Gardener course. Participants learned about pest management and how pesticides can be used safely. They also learned how to read pesticide labels. Outreach to the general public was achieved by hosting a booth at the Hartford Flower Show and through face to face and informal educational programs.

Results

Over 800 individuals attended meetings offering pesticide recertification credit. Three hundred forty-four certificates of attendance for re-certification were issued. One thousand seven hundred sixty-four individuals received commercial applicator re-certification or initial certification training.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The economy - cost of fuel, etc.

Labor availability - some production and protection methods are more labor intensive than others, and farm labor in the Northeast is becoming less available.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Climate Change: Water and Weather

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	15%		50%	
111	Conservation and Efficient Use of Water	40%		0%	
112	Watershed Protection and Management	20%		0%	
132	Weather and Climate	10%		20%	
133	Pollution Prevention and Mitigation	15%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	7.0	0.0
Actual	3.2	0.0	5.5	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
44130	0	57201	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
44130	0	57201	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
254240	0	537769	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Workshops
 Agricultural tours of farms and related facilities
 Basic and Applied research
 Webpages

2. Brief description of the target audience

Commercial agricultural producers
 Local municipal officials
 Town government volunteers
 Homeowners

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	1200	3500	0	0
Actual	1450	3500	0	0

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

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	4	
Actual	1	5	6

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2010	15	20

Output #2

Output Measure

- Training manuals and instructional CDs developed

Year	Target	Actual
2010	2	2

Output #3

Output Measure

- News releases/articles

Year	Target	Actual
2010	10	15

Output #4

Output Measure

- Websites developed

Year	Target	Actual
2010	1	2

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2010	0	0

Output #6

Output Measure

- Conference abstracts
Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2010	4	8

Output #8

Output Measure

- Presentations and short courses

Year	Target	Actual
2010	50	45

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Adoption of recommended sustainable landscape/turf BMP approaches by defined commercial and/or residential target audiences (% of target population)
2	Development of new models
3	Number of agricultural nutrient management plans adopted by defined target audience
4	Number of rain gardens installed by defined targeted audience/s
5	Awareness of recommended sustainable landscape/turf BMP approaches by targeted commercial and/or residential audiences (% of audience)

Outcome #1

1. Outcome Measures

Adoption of recommended sustainable landscape/turf BMP approaches by defined commercial and/or residential target audiences (% of target population)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	18

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The issue of using pesticides is controversial, and at the same time pesticides are an important tool used in pest management for public health, property and water protection and food production. The State of Connecticut requires that individuals using restricted-use pesticides on their own property or property which they rent for agricultural purposes become certified as private pesticide applicators. Individuals who hold themselves out for hire to apply any type of pesticides are required to be certified as commercial applicators. All applicators must maintain their certification by earning re-certification credit at educational programs. Each applicator must earn 12 educational credits in five years to qualify for recertification. One credit equals one hour of instruction on pesticide safety education and pest management. The Pesticide Safety Education Program provides educational programs for recertification of private applicators and commercial applicators, and initial certification education for Ornamental and Turf and Golf Course Superintendent's commercial certification. Additionally, pesticide safety education is provided to commodity groups, the general public and Master Gardeners volunteers

What has been done

The pesticide safety education program provided 18 workshops, seminars and demonstrations providing re-certification credits for all certified applicators helping them achieve the 12 hours of education credits necessary for recertification. The supervisory commercial ornamental and turf category represents the greatest number of commercial applicators in the state (48%). The demand for training in this category is great. The PSEP offers three formal short courses, or 16 sessions, to educate prospective applicants for certification in these categories. Other formal and informal programs about pesticide safety were presented to specific commodity/grower, green industry groups, Master Gardeners, and other groups and the general public.

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #2

1. Outcome Measures

Development of new models

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
132	Weather and Climate

Outcome #3

1. Outcome Measures

Number of agricultural nutrient management plans adopted by defined target audience

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	18

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Farmers are under increasing pressure to protect the environment. Recent research has shown that soils can become saturated with phosphorus (P). When this happens P becomes soluble and can move with rain runoff in to streams. P concentrations in streams at the parts per billion level, have been shown to increase algae blooms and eutrophication of surface water. If farms cannot learn to manage their farms without polluting the environment they will be forced out of business, and Connecticut consumers will pay more for food to be imported from out of state.

What has been done

Farms collect data to document their crop management practices for the first (baseline) year. Soil samples and other tests are conducted to document baseline conditions on the farm. Once background data is collected farms are presented with management plans to manage crop nutrients to meet the agronomic needs of the crop while at the same time minimizing the risk of environmental pollution. Plans consist of field by field recommendations for nutrient applications that may require adjustments in the rate of application, timing of application or in some instances a prohibition on applying nutrients to given fields if the soil already has sufficient nutrient levels. Some farms are forced to move manure off the farm ? either because the farm doesn't need the nutrients or the farm chooses not to haul the manure to the distant fields that can make use of the nutrients.

Results

Decreased Phosphorus applications by 93,377 pounds
Percent of fields receiving excess N 31 (93 in 2007)
Percent of fields receiving excess P2O5 39 (90 in 2007)
Percent of fields receiving excess K2O 50 (70 in 2007)

1 farm invested \$200,000 in manure separation technology to remove P2O5 from its liquid dairy

manure. Raw manure flows to a screw press to remove bulk solids for use as bedding. Separated liquid flows to a centrifuge for further solids removal. 60% of the phosphorus is removed by the 2 stage process. This will allow the farm to spread more gallons of manure per acre, decrease their road miles hauling manure, saving fuel and greenhouse gas emissions. Detailed analysis of the savings will not be available until the manure is spread in the spring of 2011.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #4

1. Outcome Measures

Number of rain gardens installed by defined targeted audience/s

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Awareness of recommended sustainable landscape/turf BMP approaches by targeted commercial and/or residential audiences (% of audience)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Comparisons between program participants (individuals, group, organizations) and non-participants

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Global Food Security: Animal Production

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	0%		50%	
302	Nutrient Utilization in Animals	20%		0%	
304	Animal Genome	0%		10%	
305	Animal Physiological Processes	0%		10%	
306	Environmental Stress in Animals	0%		10%	
307	Animal Management Systems	80%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	5.0	0.0
Actual	2.8	0.0	13.2	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
80395	0	58374	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
80395	0	58374	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
184427	0	1374039	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Workshops
 Conferences
 Applied and basic research
 On farm tours
 Web pages
 Diagnostics

2. Brief description of the target audience

Agricultural producers
 Regulatory agencies
 Policy makers

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	500	1500	150	250
Actual	1200	2500	150	300

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

Patent Applications Submitted

Year: 2010
 Plan: 1
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	2	3	
Actual	3	20	23

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Books and monographs

Year	Target	Actual
2010	1	8

Output #2

Output Measure

- Conference abstracts

Year	Target	Actual
2010	1	1

Output #3

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2010	3	15

Output #4

Output Measure

- Fact sheets and bulletins

Year	Target	Actual
2010	10	12

Output #5

Output Measure

- Websites developed

Year	Target	Actual
2010	1	3

Output #6

Output Measure

- Presentations and short courses offered

Year	Target	Actual
2010	20	30

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Specific characteristics of genomes identified
2	Fundamental understandings of animal growth identified
3	Public policy actions supporting biotechnology adopted and/or amended by governmental and other entities at international, national, regional, state and local levels.
4	Treatment methods developed for human and/or animal diseases
5	Adoption of recommended BMPs by targeted producers and/or industry sectors (% of target audience)
6	Animal production regulatory procedures adopted and/or amended by governmental agencies at national, regional, state and local levels.

Outcome #1

1. Outcome Measures

Specific characteristics of genomes identified

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Understanding the biology and underlying mechanisms of gamete development, fertilization, and embryogenesis is key to refining methods for production of genetically modified animals to improve livestock production efficiency.

What has been done

Four microarray experiments encompassing three developmental stages of the bovine embryos, two tissue sources, and two reproductive technologies were combined in two meta-analyses.

Results

Methods to chemically passaging bovine ES-like cells were developed. Strategies to improve the development of OPU oocytes to sexed blastocysts by use of helper embryo culture were developed. This is important for the preservation of genetically elite animals that are no longer reproductive. It also allows for the selection of the sex of the offspring from these animals.

4. Associated Knowledge Areas

KA Code	Knowledge Area
304	Animal Genome

Outcome #2

1. Outcome Measures

Fundamental understandings of animal growth identified

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Bone fractures and deformities are a serious problem for the broiler industry.

What has been done

It was hypothesized that oral supplementation of LiCi would increase bone strength and quality in broiler chickens. Various treatments were studied, with no apparent differences in weight or feed intake, thus indicating that the LiCi treatment did not negatively affect growth nor did it affect meat quality.

Results

There was a 23% reduction in stiffness in the femora and 34% reduction in the fracture energy in the tibiae of the LiCi treated birds.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
305	Animal Physiological Processes

Outcome #3

1. Outcome Measures

Public policy actions supporting biotechnology adopted and/or amended by governmental and other entities at international, national, regional, state and local levels.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Treatment methods developed for human and/or animal diseases

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Small ruminant owners produce meat, dairy, and fiber products. Due to over use of chemical dewormers, the internal parasites have developed genetic resistance. Poor performance and even death is the result on many farms in the world.

What has been done

Nine small ruminant farms in Connecticut volunteered for the first year of the SARE Small Ruminant Parasite Control grant (Sustainable Agriculture, Research, Education) to determine the level of infection in their animals of the barber pole worm (*Haemonchus contortus*). The study also measured the level of dewormer resistance on these farms.

An undergraduate student from the U. of Connecticut Animal Science Department visited each farm twice, two weeks apart, taking fecal samples and scoring the animals for anemia and body condition. The animals were dewormed on the first visit. The efficacy of the dewormers was evaluated by U. of Rhode Island by checking for parasite eggs in the feces on the second visit and comparing to the level on the initial visit. Feces were also sent to Virginia Tech to grow out the eggs to identify the worms on the CT farms. The farmers were notified of the results as well as their veterinarians.

Results

Results indicate that all farms sampled have barber pole worm present, with resistance to the dewormer being used on five out of the nine farms. The producers learned about selective deworming to reduce the excessive use of chemicals and delay the increase in resistance by the parasites to those chemical dewormers. The use of tools to select animals to treat for parasites was shared, including the FAMACHA color coded card to detect anemia from the blood consumption in the animal's stomach. The testing of the animal's feces for parasite worms was another tool to determine which animals actually needed deworming and whether the dewormer was effective. All nine farms practiced scoring anemia with the FAMACHA card as well as fecal sampling their animals for egg counts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
305	Animal Physiological Processes
307	Animal Management Systems

Outcome #5

1. Outcome Measures

Adoption of recommended BMPs by targeted producers and/or industry sectors (% of target audience)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15	18

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Farmers are under increasing pressure to protect the environment. Recent research has shown that soils can become saturated with phosphorus (P). When this happens P becomes soluble and can move with rain runoff in to streams. P concentrations in streams at the parts per billion level, have been shown to increase algae blooms and eutrophication of surface water. If farms cannot learn to manage their farms without polluting the environment they will be forced out of business, and Connecticut consumers will pay more for food to be imported from out of state.

What has been done

Farmers are under increasing pressure to protect the environment. Recent research has shown that soils can become saturated with phosphorus (P). When this happens P becomes soluble and can move with rain runoff in to streams. P concentrations in streams at the parts per billion level, have been shown to increase algae blooms and eutrophication of surface water. If farms cannot learn to manage their farms without polluting the environment they will be forced out of business, and Connecticut consumers will pay more for food to be imported from out of state.

Results

18 farms developed nutrient management plans.

Decreased Phosphorus applications by 93,377 pounds

Percent of fields receiving excess N 31

Percent of fields receiving excess P2O5 39

Percent of fields receiving excess K2O 50

1 farm invested \$200,000 in manure separation technology to remove P2O5 from its liquid dairy manure. Raw manure flows to a screw press to remove bulk solids for use as bedding. Separated liquid flows to a centrifuge for further solids removal. 60% of the phosphorus is removed by the 2 stage process. This will allow the farm to spread more gallons of manure per acre, decrease their road miles hauling manure, saving fuel and greenhouse gas emissions. Detailed analysis of the savings will not be available until the manure is spread in the spring of 2011.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #6

1. Outcome Measures

Animal production regulatory procedures adopted and/or amended by governmental agencies at national, regional, state and local levels.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Important concerns regarding food safety, farm preservation and farm viability has stimulated renewed interest in the production of local food. Meat producers in Connecticut, Massachusetts and Rhode Island (the tri-state area) indicated, through a survey of meat producers in that there are a number of production, processing and marketing issues that must be addressed. This project provided education on grazing options, a review of the slaughter and processing needs of the industry and marketing ideas to meet the demand for local meats. The need for a USDA certified slaughter facility is the top priority.

What has been done

This project was designed to increase engagement of farmers, Cooperative Extension Personnel in Connecticut, Massachusetts and Rhode Island, Departments of Agriculture, other state and local agencies, USDA agencies and NGOs in the production, processing and marketing of natural locally grown meats and other products for consumers. Temple Grandin, world renowned expert in the humane treatment of animals, conducted seminars at the three Universities and for the public at Old Sturbridge in Massachusetts.

Project performance targets included educational events on sustainable grazing practices, demonstrations of successful marketing techniques, and the development of a Strategic Plan to understand the needs and issues of the industry relative to slaughter and processing of meat. This Strategic Plan, in the development stage, looked at whether existing facilities may be sufficient to serve the needs of meat producers in the near future, if new facilities may be needed or how managing of breeding would provide for a supply of locally produced meat throughout the year. Consumers will benefit from the availability of locally grown natural meats. Farmers will benefit from selling their meat directly to consumers. During the year workshops were held at various locations on such topics as grazing. Discussions have been held with various agencies about slaughter facilities.

Results

The program assessed the complex issues concerning producing, processing and marketing of locally produced meat. The program provided important information to farmers on grazing practices, meat processing and are currently in the development stage of a Strategic Plan that will address the infrastructure needs of the industry to meet the demands of producers to market their meat more directly to consumers. There has been a significant increase in the knowledge of the need for USDA certified slaughter houses in Connecticut by regulators and policy makers at all levels in Connecticut, including the Governor. However, the economics, the regulations at local, state and federal levels, and the many viewpoints make it a slow road to implementation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Case Study

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)**Program # 10****1. Name of the Planned Program**

Food Safety: Animal Protection

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	15%		0%	
311	Animal Diseases	85%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	9.0	0.0
Actual	2.6	0.0	9.7	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
7428	0	40488	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
7428	0	40488	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
553871	0	1176469	0

V(D). Planned Program (Activity)**1. Brief description of the Activity**

Workshops
 Applied and Basic Research
 Consultations
 Fact sheets

2. Brief description of the target audience

Commercial Poultry producers
 Back yard poultry producers
 4-H Youth
 School teachers

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	250	1500	0	0
Actual	400	2000	250	600

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

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	7	
Actual	10	18	28

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Workshops and conferences

Year	Target	Actual
2010	1	4

Output #2

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2010	5	12

Output #3

Output Measure

- Websites developed

Year	Target	Actual
2010	1	5

Output #4

Output Measure

- Animal cases examined

Year	Target	Actual
2010	1300	1500

Output #5

Output Measure

- Disease surveillance programs implemented

Year	Target	Actual
2010	1	1

Output #6

Output Measure

- Books and monographs

Year	Target	Actual
2010	1	18

Output #7

Output Measure

- Conference abstracts

Year	Target	Actual
2010	1	1

Output #8

Output Measure

- Presentations and short courses

Year	Target	Actual
2010	10	35

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Development of new recombinant vaccines
2	New diagnostic tests and approaches developed
3	Animal protection-related actions/procedures adopted and/or implemented by governmental and other entities at the international, national, regional, state and local levels.
4	Number of healthy backyard poultry flocks

Outcome #1

1. Outcome Measures

Development of new recombinant vaccines

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Vaccinia virus,(v.v.) the poxvirus used as the smallpox vaccine, led to the eradication of smallpox because it induces strong immune responses, is affordable and heat stable; it is also a vector for recombinant vaccines and have the potential to be developed as polyvalent vaccines expressing antigens from multiple infectious agents. Progress has been slow due to the small number of v.v. promoters available. Thus the need for a synthetic form is important.

What has been done

A number of combined early/late promoter sequences were designed to optimize promoter strength and sequence diversity with existing synthetic promoter sequences. This was accomplished by overlapping optimal minimal early and late poxvirus promoter sequences. These optimal sequences were derived from an extensive review of the literature on pox promoters.

Results

Although early in the project, positive outcomes include: 1)a number of new synthetic promoter sequences designed; 2)successful cloning of these sequences in the transfer vector for analysis of promoter activity; 3)all designed promoters were able to induce transcription of the reporter gene as attested by fluorescence microscopy of cells transfected with the transfer vectors. It is now possible to characterize the activity of the promoters in terms of strength and timing as well as their stability.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

Outcome #2

1. Outcome Measures

New diagnostic tests and approaches developed

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Connecticut is home to a very large poultry farm with several million birds, and seven poultry facilities located in five towns in eastern part of the state. The firm is the largest egg producer in the state, and one of the largest in the northeastern United States. It employs several hundred people, and has gross sales of close to \$90 million and reportedly supplies more than 90 percent of Connecticut's egg market. The company's large customers include major supermarket chains such as Wal-Mart, Stop & Shop, Big Y, Shaws, BJ's Wholesale, etc. Ensuring flock health is critical to both the local and state economy and public health. On the other end of the scale, there has been a steady increase in the number of backyard poultry flocks, primarily for egg production in rural, suburban and urban areas. Ensuring the health of these flocks is equally important, not only for economic reasons and general public health, but to maintain trust in the safety of agriculture in Connecticut.

What has been done

Rapid and accurate disease diagnosis of potentially affected poultry flocks will protect flocks from devastating diseases such as avian influenza, exotic Newcastle disease, and other viral and bacterial infections in the state of Connecticut. This is important for public health and economic reasons. Through the Avian Diagnostic Laboratory, student intern pathologists assisted with poultry and pet birds submissions by conducting postmortem examinations to determine cause of death or specific infection. Recommendations were provided on the control, treatment and vaccination programs against poultry disease findings to poultry farm owners. Advised the poultry/pet bird owners on the results of pathological examination for protection of the remaining birds. Also, provided training of intern student pathologists on the histopathological findings and bacteriological results. Work was done in conjunction with the Board Members of Connecticut Poultry Association (CPA) and State of Connecticut Agriculture Department. Through the

Extension Poultry Health Services responses were provided to frequent telephone calls from poultry, pet bird and game bird farms in the state, with information on current poultry vaccination and medical treatment programs for various viral and bacterial infections. Made visits to commercial poultry and game bird farms to discuss health and poultry management with producers to prevent further losses due to diseases. Served as Extension veterinary advisor with the CPA to discuss poultry health situations in the New England states and around the world and important diseases such as Avian influenza, Salmonella enteridis (SE) infection in poultry, and their potential human health implications. Provide information, on the control of SE and avian influenza contamination thorough cleaning, bio-security, pest management and possible vaccination programs. Provide information on the control of exotic Newcastle disease in commercial poultry and its implication due to an outbreak on international trades

Results

No major outbreaks of poultry related diseases.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

Outcome #3

1. Outcome Measures

Animal protection-related actions/procedures adopted and/or implemented by governmental and other entities at the international, national, regional, state and local levels.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The permitting process has been identified as the primary constraint to new development and expansion of the aquaculture industry. As such, any efforts to streamline the application and review process and educate stakeholders about these processes has the potential to improve viability of aquaculture both locally and nationally

What has been done

The Connecticut Aquaculture Permitting Workgroup (UConn=chair; Connecticut Department of Agriculture, Connecticut Department of Environmental Protection, US Army Corps of Engineers) met regularly to discuss ways to streamline the permitting process for aquaculture in Connecticut. The group identified a new strategy to improve the permitting process for low-impact marine aquaculture projects. This process, to be implemented in May 2011, will drastically reduce the paperwork and reporting requirements for projects that have minimal impacts to navigation, protected habitats and endangered species. This will be a cost- and time-savings for producers and resource managers.

In addition, the UConn team member co-authored with the U.S. Army Corps of Engineers a book chapter entitled, "Balancing Economic Development and Conservation of Living Marine Resource and Habitats: The Role of Aquaculture Resource Managers?". That chapter was published in 2011 in the book "Shellfish Aquaculture and the Environment?" by Wiley Scientific Publishing. Faculty from UConn Marine Sciences created an outline and technical content for a website "Shellfish Aquaculture and the Environment ? Permitting Perspectives?". This website, targeted towards aquaculture producers and resource managers, will be published in 2011 by the National Oceanic and Atmospheric Administration National Marine Fisheries Service Aquaculture Program.

Results

The time taken to acquire aquaculture permits has been reduced from an average of 12 to 6 months. This is a time and cost saving for both the aquaculture producer and local, state and federal resource managers. In addition, several outreach products have been developed for the industry. Development and delivery of outreach products and presentations have allowed for improved producers' knowledge of the permitting process.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

Outcome #4

1. Outcome Measures

Number of healthy backyard poultry flocks

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
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2010 {No Data Entered} 60

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As urbanization increases more youth and families are choosing to rear poultry for non-commercial use in New England. This includes chickens, ducks, turkeys, geese, gamebirds and other fancy fowl. In the spring of 2010 more than 88,000 baby chicks (meat type, layer type and fancy fowl), pullets and adult birds were purchased by small flock owners throughout the New England states. According to suppliers, they cannot keep up with the demand. Small flock owners are generally less experienced in the management of poultry and are more likely to mismanage the birds under their care, relative to proper nutrition, health care, humane treatment, breeding, transporting, and other management issues. The threat of avian influenza has heightened awareness of the need for proper biosecurity in rearing poultry. As a result more small flock owners are seeking information and education about AI and its affects. The focus was to educate small poultry flock owners about the proper management and health care of their poultry.

What has been done

More than 50 adult volunteer leaders helped with 4-H poultry projects and another 65 or more school teachers were involved indirectly through incubation and embryology projects. Also 13 UConn Poultry Science Club members were involved in volunteer work in setting up and running the 15th Annual Southern New England 4-H Poultry Show and Showmanship program. Support was provided to 4-H agents throughout CT and New England, as well as collaborations with tFFA, Farm Bureau, Connecticut Poultry Association, and the Connecticut Dept. of Agriculture on youth projects. Volunteers (47) were trained in emergency poultry rescue techniques at three workshops throughout Connecticut. These volunteers will help move poultry away from natural disaster sites or rescue them from situations of animal abuse. The participants in the SARE grant met for a three day workshop in October 2010 to learn about breeds of poultry, poultry housing, poultry nutrition and anatomy and physiology. A follow up webinar was also held to help establish discipline teams within the group. In addition, 11 small flock workshops were held during this time period with over 250 people in attendance learning the basics of choosing birds, housing, nutrition and basic health care of poultry. These were sponsored by several AGWAY Stores, by the Essex, CT library, and by the Henry Carter Hull Library in Clinton, CT.

Results

Through the following activities, the public is becoming aware of resources for learning to raise healthy flocks of poultry in backyards, which until recently, had disappeared from most areas. 124 youth participated in the 15th Annual Southern New England 4-H Poultry Show and Showmanship contest April 2010. In addition to maintaining two small poultry flock oriented web sites (<http://web2.uconn.edu/poultry/4-hpoultry> and <http://web2.uconn.edu/poultry/poultrypages>) the following activities were conducted during the period: 1 FFA Poultry and Egg Judging Contest, 34 youth; 1 Omelet making/food safety hands on demonstration at the Big E, with about 350 direct participants both youth and adults and several thousand observers. As a result of Youth and Non-Commercial Poultry Programs, there has been steady increase in interest in poultry rearing with over 250 people attending various workshops during this reporting period seeking advice on purchasing, rearing, managing, etc. of small egg, meat or show bird flocks. Of the 237 plus contacts by phone or email, about 63 of these are new to poultry within the past year. The economic impact on CT and New England is considerable. Small flock owners purchase 50lb or 100 lb bags of feed at \$15 to \$20+ per bag. This is equivalent to \$400 to \$600

per ton of feed, which in bulk sells for about \$280 to \$400 per ton. This increased profitability to businesses carries through to other products for poultry rearing.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The complexity of local, state and federal regulations, and the economy are among the factors limiting the implementation of slaughter facilities in the state.

The ultimate goal of the program is safe food; however, the public and funders respond to food outbreaks that make the press, in terms of gaining additional funding.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- Case Study

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}