2009 University of Connecticut - Storrs Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

The University of Connecticut Extension and Research programs are part of the College of Agriculture and Natural Resources.

Connecticut has 169 cities and towns, ranging in size from Bridgeport with a population of 140,000 to Oroco, with 273 residents. There is no county government in Connecticut. Many towns rely on volunteers to conduct local government business, and do not have the professional staff that cities and the large suburban towns function with. Through the University of Connecticut Cooperative Extension and academic departments of the College of Agriculture and Natural Resources, towns can access significant volunteer, producer and consumer education opportunities on important topics.

Both Extension and Research programs benefit from collaborations and partnerships with local, state, regional, national and international agencies and organzations. Benefits include better communication with the diverse poputions of the state, additional resources, both financial and expertise, and the ability to effect a coordinated approach to some of the state's major problems.

Collaborators include (not limited to) state and local planning boards, the state departments of Environmental Protection, Agriculture, Education, Consumer Protection, and Public Health; the Connecticut Food Policy Council, the Farm Bureau, various land trusts, youth organizations, Head Start,

The following is an overview of programs and services.

Land Use and Forestry. In a state in which 58% of the land is forested, sustainable practices related to forests, land and water resources are the focus of programs.

The Center for Land Use Education and Research (CLEAR) conducts research and education focusing on the impacts of land use on natural resources to assist local land use decision makers. The Connecticut Land Use Academy provides basic training for elected and appointed land use commissioners, on topics ranging from legal responsibilities to map reading. The Geospatial Technology Program provides training on geospatial information technologies like geographic information systems (GIS), remote sensing (RS), and global positioning systems (GPS).

Green Valley Institute (GVI) offers educational programs for municipal decision makers and others involved in land use planning in the Quinebaug-Shetucket National Heritage Corridor. The Land Use Planning Program is a statewide program that addresses a wide range of planning issues for Connecticut communities. Program topics range from Open Space Planning and Farmland Preservation to Economic Development. The Nonpoint Education for Municipal Officials (NEMO) Program conducts educational workshops to provide information, education and assistance to local land use boards and commissions on how they can accommodate growth while protecting their natural resources and community character. The Northeastern Research Center for Wildlife Diseases conducts research on new and poorly understood diseases of wildlife and diagnosis of diseases in wildlife.

Business:

The Connecticut Tax School provides education for accountants and tax professionals on state and federal tax law updates, in cooperation with the Internal Revenue Service and the Connecticut Department of Revenue Services. The Farm Risk Management and Crop Insurance Program conducts educational programs related to farm management. The Connecticut Women's Agricultural Network offers programs and networking to beginning farmers, both men and women, through workshops, tours and consultations. The Food Marketing Policy Center focuses on the organization and performance of food markets in the State of Connecticut, nationally and globally.

Nutrition Education programs are directed primarily to limited resource families in the state's large cities.

The Expanded Food and Nutrition Program (EFNEP) provides food and nutrition education to low-income families, youth and individuals to improve eating patterns, shopping and food preparation skills. Family Nutrition Program (Food Stamp Nutrition Education) conducts nutrition and food safety education initiatives for teachers, school children, and food service staff (Team Nutrition).

Family, Children and Youth programs are directed toward improving healthy lifestyles across the life span.

Childcare Programs provide education programs in child development, and parent education. Family Development Programs address financial management and literacy, identity fraud prevention, and consumer education.

4-H Youth Development Program assists youth in acquiring knowledge, developing life skills and forming attitudes to become self directing and productive members of society through volunteer led clubs and events, skill based contests, and career-related conferences.

Healthy Home Environments helps homeowners learn how to maintian healthy home environments and household management. Healthy Environments for Children provides education on the physical and psychological health of children in the area of indoor air quality, specializing in lead poisoning prevention education, asthma, and radon. People Empowering People (PEP) builds on strengths of adults and older teens through volunteers trained to conduct education programs that stress community development activities, at family resource centers, community-based organizations, and correctional facilities.

Agriculture programs focus on production and sustainable environment skills for producers and consumers.

The Aquaculture Program provides courses for the marine aquaculture industry in Connecticut and the Northeast on environmental, social and economic aspects of aquaculture. The Dairy/Livestock Program provides individual counseling and workshops to producers on both production and business management including direct marketing of livestock products and well as programs on manure management to reduce pollution and associated regulations. The Farm Risk Management and Crop Insurance Program conducts educational programs related to farm management, crop insurance, and risk management strategies.

The Home and Garden Education Center provides information for Connecticut residents on sustainable gardening topics, with an emphasis on minimizing environmental impacts; current focus is on reducing invasive, non-native plants and increasing water conservation. Sustainable Landscapes and Residential Water Quality Program offers programs directed to municpal boards and homeowners, incorporating regional and national research results to address issues of septic systems and well water, nutrient and pesticide management, landscaping management, and plant selections. The Master Gardener Program provides horticultural-related information to the public through trained volunteers at locations throughout the state, often through demonstration sites at public facilities.

Integrated Pest Management (IPM) educates both producers and consumers about sustainable approaches to managing pests. Plant Agriculture provides educational programs related to horticultural crop production and marketing for the large fresh market produce and fruit industry, as well as the nursery and perennial industry. The Soil Nutrient Analysis Laboratory provides soil fertility testing and recommendations to both growers and consumers. The Connecticut Veterinary Medical Diagnostic Laboratory provides biopsy services for a variety of diseases in cooperation with state and local agencies, veterinarians and consumers.

Strategic Planning:

During 2008-2009, the College undertook a strategic planning process. The change in the economy, a retirement incentive program and limitations on hiring by the University have somewhat limited the pace of implementation. However, the College is committed to the following goals and strategies that will guide it's research and extension efforts in the next five years.

Goal 1. Promote the health and well-being of Connecticut citizens and enhance the social, economic and natural environment of the state through outreach and non-formal education.

Strategies

1. Better identify, prioritize and address state and local needs for outreach.

2. Facilitate the translation of research into practice by transferring the knowledge to the end user.
3. Improve the measurement and assessment of engagement outcomes and program impacts.
4. The College administration will better promote the primary outreach programs in the College, particularly in the focus areas of the environment and health and well-being.

Goal 2. Increase the visibility and accessibility of faculty expertise.

Strategy:

1. Increase faculty input into public policy decisions.

Goal 3. Improve public access to university-housed resources and faculty.

Strategies:

1. Improve the visibility and reach of College programming designed to promote lifelong learning and professional development.
2. Establish an effective mechanism to inform the University, legislature and communities of College outreach programs.
3. Expand the use of technology to increase access to College programs and educational opportunities.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	67.0	0.0	58.0	0.0
Actual	80.4	0.0	78.6	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 is relatively unchanged from previous years. It is based on the standards set by the University. Reviews are conducted within departments, the College and the University. Review of certain projects is undertaken by peer institution faculty and key stakeholders. Peer review for Hatch, McIntire-Stennis and Animal Health projects is undertaken by scientists and administrators as appropriate.

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
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups

- Survey of traditional stakeholder individuals
- Survey of the general public

Brief explanation.

As in the past, collaborative programming and other efforts with many state agencies, commissions and non-governmental groups provides continuous contact with stakeholders across a broad spectrum on issues pertinent to each group. Faculty and staff work closely with state agencies/departments such as Agriculture, Social Services, Public Health and Consumer Protection. Faculty and staff are members of state commissions, such as the Connecticut Food Policy Council. They also work with NGO's such as Farm Bureau, Connecticut Family and Consumer Science Association, various agricultural commodity organizations, etc. The State Extension Partners Council, comprised of representatives that are integral to Cooperative Extension, such as 4-H Leader Associations, Fair Boards, Master Gardener Association and County Extension Councils, meets regularly to provide input and direction on program development. The leadership team of the College engages this group in discussion on current and emerging trends and issues in the state. The Dean continues to meet regularly with many organizations throughout the state to discuss their needs and interests, and how the College may address them. As indicated in the new College strategic plan, the dean is forming a state advisory board that will identify state and local needs. The 20 plus members will represent a cross section of key Connecticut stakeholders and representative from state organizations and agencies.

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
- Needs Assessments
- Use Surveys
- Other (Events)

Brief explanation.

Program teams have advisory groups, ranging from formal groups, which meet regularly, to those that meet less frequently. These groups represent service providers and collaborators, stakeholders in general, as well as end users. Program teams select advisory group members from past program participants, representatives of agencies who are also addressing an issue, as well as program collaborators. There is an increasing use of web surveys to connect with stakeholders who may not participate in traditional ways.

The eight County Extension Councils also identify needs and issues, and recommend programs based on knowledge of their county. The State Partners Council undertakes a structured needs assessment process periodically, which serves as a model for county councils to use in their county. The College-sponsored Fall Cornucopia, an on-campus event which attracts over 3000 people, provides an opportunity for non-traditional users of Extension and Research to interact with faculty and staff from many departments and projects.

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
- Meeting specifically with non-traditional individuals

Brief explanation.

Sstakeholders, such as commodity producers, town officials and 4-H leaders, provide input through personal contact, end of program assessments, association meetings, and surveys. More program staff are using web based surveys in conjunction with web pages, or as a stand-alone method to collect information. Faculty and staff participation in boards, commissioners and project meetings with other groups and agencies provides data on

needs and issues. Also, data from questions asked via web pages is also tracked by some program staff, providing information on current problems.

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, both direct (advisory council meetings, surveys.etc.) and indirect (meetings of other organizations attended by Extension and research personnel), is used in planning both major directions and specific programs and projects. Such information is also used to reduce or re-direct program resources, apply for grants, and how programs are conducted - for example, large meetings versus small group sessions.

Brief Explanation of what you learned from your Stakeholders

Stakeholders have identified programmatic gaps, emerging issues, what other agencies are doing or not doing, etc. In many cases, the major issue is the economy, or current or proposed legislation. The College can address these by providing information, education and skills to individuals, local board and organizations, so that they can better take appropriate action on their own. For example, stakeholders on an Agricultural Advisory committee identified problems applying for funds from USDA agencies.

Stakeholders are expecting sustainable practices at meetings - for example, no plastic or non-reusable or recyclable items.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2070458	0	1110050	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	1488058	0	158827	0
Actual Matching	1488058	0	158827	0
Actual All Other	5147318	0	6899500	0
Total Actual Expended	8123434	0	7217154	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from				
Carryover	125608	0	761400	0

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

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	25%		25%	
703	Nutrition Education and Behavior	35%		35%	
704	Nutrition and Hunger in the Population	20%		20%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	5%		5%	
724	Healthy Lifestyle	10%		10%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	12.0	0.0	10.0	0.0
Actual	22.0	0.0	12.0	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**
133351	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
133351	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
1471134	0	1146016	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Content was made available educational workshops, conferences, individual consultations, training sessions, newsletters, fact sheets, web pages.

2. Brief description of the target audience

Consumers, public policy decision-makers, health officials, academic researchers

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	5000	13500	130	550
Actual	4800	15000	750	2800

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	3	5	
Actual	2	8	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2009	50	45

Output #2

Output Measure

- Websites developed

Year	Target	Actual
2009	2	2

Output #3

Output Measure

- Media releases

Year	Target	Actual
2009	23	31

Output #4

Output Measure

- Books and monographs

Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2009	3	135

Output #6

Output Measure

- Presentations and short courses

Year	Target	Actual
2009	65	61

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 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Connecticut has seen a huge increase in the numbers of families with children using soup kitchens and food assistance. For example, there was over 10% increase in families receiving SNAP benefits in January 2009, compared to January, 2008. EFNEP works with families and youth who are living in poverty and facing barriers to balanced nutrition which include limited resources to buy food, poor access to supermarkets, expensive housing and energy costs, limited food preparation and storage facilities, marginal health care, cuts in benefits or low-paying jobs, lack of affordable and good quality day care, limited transportation and few opportunities to help them escape poverty. Many have low literacy skills. Poor nutrition can lead to higher rates of infant mortality, low birth weight infants, learning disabilities, school absenteeism, compromised immunity, obesity, chronic diseases and hunger. Recent data collected by USDA indicates that 8.8% of Connecticut households are food insecure (about 100,000 households). 3.0% of CT households experience "very low food security." Households with children are 40% more likely to experience food insecurity.

What has been done
This program partners with 100 agencies and community organizations in providing nutrition education programs to their clientele. 100 volunteers, representing 0.8 FTE, assisted EFNEP staff in conducting community based programs. 9 worked with youth, 91 worked with adults. Their efforts included providing meeting space, refreshments, equipment; clerical support, recruiting participants, advertising and promoting programs. 12% were former or current EFNEP participants. 23% of EFNEP volunteers were non-Hispanic white, 30% were Hispanic, and 27% were non-Hispanic Black.

EFNEP staff and volunteers reached 480 homemakers representing 1402 family members including 610 children. 85% "graduated", completing 5 lessons over the course of about 5 months on average. Over 65% participated in USDA food assistance programs, including 48% on Food Stamps. 37% were Hispanic. 20% were non-Hispanic Black; 24% non-Hispanic White, 1% were Asian or Native American. 81% live in metropolitan areas. 53% had incomes at or below 75% poverty.

1285 youth were reached: 72% in urban/suburban areas; 31% were Hispanic, 37% were Black, 25% White, 2% were Asian or Native American.

Interactive, personalized workshops/presentations were delivered to participants from over 100 community-based agencies. Families are reached at these agencies, or through referrals, in small group programs (87%), home visits

(2%) or combination (12%). Program topics meet participants' needs, but all include basic information about choosing foods to follow the USDA My Pyramid. Other topics include nutrition during pregnancy (14% of clients were pregnant or nursing); feeding infants and children; planning meals and snacks; shopping skills; reading labels; foods for fitness and health; food safety; cutting down on fat, sugar and salt; increasing fiber. Many include sample recipe tasting. Some are presented in Spanish.

Results
Those eating no vegetables decreased from 12% of the participants to only 4%, and those eating the 3 or more cups of vegetables increased from 45% to 59%. Those consuming no fruit decreased from 38% of the participants to 25%. Those following the guidelines to eat 2 or more cups of fruit increased from 28% to 45%. 8% of EFNEP graduates were eating 6+ cups of fruits and vegetables combined before EFNEP participation, and 17% reported eating 6+ cups of fruits and vegetables after EFNEP participation. Nutrients such as protein, iron, calcium, and several vitamins also showed positive change. For dietary fiber, before EFNEP education, 14% of the homemakers had diets containing 4 grams or less of fiber, while after EFNEP, only 6% had such low fiber levels. Healthy Eating Index (HEI) scores also improved.

Food behavior evaluations of a sample of participants showed that 78% improved one or more practices related to food resource management, 60% improved in food safety, and 81% improved in nutrition practices (planning meals, reading labels, children eating breakfast). Major improvements were seen in the numbers of participants more often planning meals (44% improved), reading the nutrition label (47%improved), using a grocery list (42% improved), following recommended food safety practices (23% improved).

4. Associated Knowledge Areas

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

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
2009	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Latinos are now the largest minority group in the state of Connecticut. Between 1990 and 2000, the Latino/Hispanic population in Connecticut grew by 50.3% (from 213,116 to 320,323 individuals). Latinos experience a disproportionately high rate of many chronic health conditions, including type II diabetes and experience premature age-adjusted mortality due to diabetes at a rate that is almost twice as high as that in Whites. In 2005, in partnership with collaborators at the Hispanic Health Council and Hartford Hospital, Dr. Rafael

Pérez-Escamilla secured $8.25 million over 5 years for an to establish the NIH-funded Connecticut Center for Eliminating Health Disparities among Latinos. The objectives of the Connecticut Center to Eliminate Health Disparities Among Latinos are to: a) advance the science directed toward reducing, eliminating, or preventing health disparities; b) accelerate the discovery of new interventions and expand/adapt exiting interventions for reducing, eliminating or preventing health disparities; c) increase the number of researchers and professionals from minority and medically underserved populations trained in biomedical and behavioral research; d)increase the quality of training provided to professionals conducting research on health disparities; and e) increase public trust and the dissemination of scientific and health information relevant to health disparity populations.

What has been done

The Center's Diabetes Peer Counseling Randomized Trial has completed recruitment of 211 participants and continues to have steady progress with follow-up of participants. Preliminary findings from this study indicate that the diabetes peer counseling intervention is resulting in a significant improvement in glycemic control of participants receiving this service. CEHDL's 4th annual conference, held on May 19, 2009 (Social Determinants of Health) was attended by 159 people. This conference featured Dr. Adewale Troutman as the keynote speaker, who was featured in the PBS documentary, "Unnatural Causes: Is Inequality Making Us Sick?" Facilitated discussions at this conference generated recommendations to remove barriers which perpetuate health disparities for 15 health conditions. CEHDL's Community Forum was held in April, 2009 and featured a facilitated dialogue on stress, educational sessions and wellness activities. Twenty-five seminars were sponsored or co-sponsored by CEHDL this year, and 19 abstracts based on CEHDL-affiliated research were presented at scientific conferences.

Results

Preliminary results from CEHDL's Diabetes Peer Counseling Randomized Trial were presented at the Experimental Biology 2009 Conference in New Orleans. These results indicate that the diabetes peer counseling intervention is effective in controlling blood sugar levels among the low-income Hispanic participants in this trial. The preliminary results indicated that there was a significant reduction in the HbA1c levels of participants in the intervention group. This significant finding reflects better control of blood glucose levels over the past 10-12 weeks among those assigned to the peer counseling intervention.

Dr. Rafael Pérez-Escamilla has been invited to serve on the US National Dietary Guidelines Committee. CEHDL's 4th annual conference in 2009 attracted159 participants who were addressed by an internationally recognized expert on health disparities, Dr. Adewale Troutman, who was featured on the PBS documentary, "Unnatural Causes: Is inequality making us sick?" Working groups generated suggestions to help reduce the disparities that exist for 15 different health conditions.

Another CEHDL-supported research project, Breastfeeding Education and Support Trial for Obese Women (BESTOW), has preliminary findings which highlight the efficacy of specialized peer counselors, who promote exclusive breastfeeding among overweight and obese low-income women. In this study, women who received the specialized peer counseling intervention were more likely to be breastfeeding at 2 weeks, 1 month and 2 months postpartum than women receiving usual care.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Reduced (%) levels of obesity by target populations

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Among the potential health benefits of green tea (GT), its lipid-lowering effect has been well documented in various animal models. At present, the mechanisms underlying the lipid-lowering effect of GT are not well understood. The objective of this study was to determine whether dietary GT affects the expression of genes regulating liver synthesis and intestinal absorption of lipids in an animal model of postmenopausal state in humans.

What has been done
Ovariectomized Sprague-Dawley rats (Harlan Sprague Dawley,Indianapolis, IN) were individually housed in a temperature and humidity controlled room. Rats were assigned to the following 4 groups; 1) a control group fed a rodent diet (AIN-93G) with corn starch as the major carbohydrate source; 2) another control group fed the same diet but containing fructose (F) in place of corn starch; 3) a group fed the F diet but containing 0.5% GT (lyophilized powder, Unilever Bestfoods North America); and 4) another group fed the F diet containing 1% GT. The economy has had a major impact on food availability with area food banks reporting an increase in families and individuals seeking assistance. However, funding for education has not increased.

Results
The study provides new evidence (as published in the Journal of Nutrition 139:640-645, 2009) that GT significantly lower the liver expression of key genes that are responsible for fat and cholesterol synthesis. The fat and cholesterol-lowering effect of GT in plasma and liver may be mediated partly via the suppression of lipogenesis and inhibition of intestinal digestion and absorption of lipids. This finding may serve as a basis for specific dietary recommendations regarding the inclusion of green tea in diets to prevent a rise in liver and plasma lipids in postmenopausal women. In summary, a moderate intake of green tea suppresses the expression of genes involved in lipid synthesis and lowers liver and plasma triglyceride in an animal model of postmenopausal state. Since elevated liver and plasma triglyceride is an independent risk factor for coronary heart disease, green tea may be recommended as dietary means of lowering the risk of the disease.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
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 has had a major impact on food availability with area food banks reporting an increase in families and individuals seeking assistance. However, funding for education has not increased. Family budgets are stressed by unemployment and under-employment

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)
- Comparisons between program participants (individuals, group, organizations) and non-participants

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

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	35%		35%	
603	Market Economics	15%		15%	
605	Natural Resource and Environmental Economics	35%		35%	
606	International Trade and Development	15%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	4.0	0.0
Actual	3.2	0.0	4.0	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**
21562	0	54808	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
21562	0	54808	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
452004	0	425980	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conducted farm tours
Conducted individual consultations
Conducted conferences, workshops and other activities
Kept web pages current
Staffed exhibits at partner and collaborator meetings
Updated fact sheets.

2. Brief description of the target audience

Agricultural producers, tax practitioners, fishers and other water-based users, public policy personnel (including state, regional, national and international officials).

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	550	1500	0	0
Actual	600	3750	0	500

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	4	
Actual	0	4	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Web sites developed

Year	Target	Actual
2009	1	2

Output #2

Output Measure

- Media articles

Year	Target	Actual
2009	3	6

Output #3

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2009	5	30

Output #4

Output Measure

- Presentations and short courses

Year	Target	Actual
2009	15	17

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2009	0	0

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
2009	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 entitties 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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Connecticut's municipal shellfish commissions are responsible for managing shellfish resources, and recreational and commercial shellfisheries including aquaculture, within their town waters. Each commission is required to develop a comprehensive management plan that includes a process for evaluating and permitting applications for shellfisheries activity. As part of the evaluation process commissions are required to identify potential social and use conflicts, as well as potential effects on protected habitats and/or species resulting from shellfishing activity. Shellfish commissions routinely use several types of geospatial information in the review of shellfishing applications such as distribution and abundance of local marine resources, mooring positions, shellfish area classifications, water quality and sediment characteristics, and location of existing commercial and recreational activity. This data varies in form and accuracy. This has made the decision-making process with respect to shellfisheries difficult for municipal managers. Adding to the complexity is the fact that the majority of commission members have not had formal training in the utilization of geospatial data and GIS software.

What has been done
Connecticut Sea Grant Extension and The University of Connecticut Geospatial Technology Program trained 30 individuals representing 10 shellfish commissions and Department of Agriculture employees in applying GIS and GPS to municipal shellfisheries management. Following the training workshops each municipality selected a project to test their knowledge of geospatial technologies in the field. Typical projects included data collection and mapping of leased shellfish beds or shellfish distribution and abundance. The Connecticut Sea Grant Extension Program and the Connecticut Department of Agriculture, Bureau of Aquaculture assisted commissions with project design, data collection and evaluation.

Results
Municipal shellfish commissions have an increased understanding of geospatial technologies and are better equipped to make informed decisions regarding commercial and recreational shellfisheries and aquaculture; eight town took action. As examples: The Town of Groton Shellfish Commission used GIS to identify and map all watersheds in the town and the associated salt water sub-estuary receiving runoff from each watershed. These maps and associated data provide the basis for calculating the contaminant load reaching each estuary and will enable the development of specifications for maximum tolerable load; this information will factor into planning and zoning decisions. The Town of Branford developed a GIS map with commercial leases and privately owned beds

which allowed them to open new areas for shellfishing and aquaculture activity. The Town of Guilford has updated its recreational and commercial shellfishing lease maps using GIS, as well as created layers for the town's mooring areas and a salinity grid. This will allow them to make more informed decisions regarding future siting of shellfish enhancement and stocking programs.
The Town of East Lyme has completed GIS layers of shellfish leases, mooring areas and eelgrass coverage. The Commission is also working with the Town Planner to integrate this information into the town's database which will allow them to make more informed decisions regarding the siting of new shellfishing and aquaculture leases.

4. Associated Knowledge Areas

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics

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
2009	5	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Collaborative efforts are critical to address agricultural issues in small urban state, where much of the population is in large cities (Bridgeport, Hartford, Stamford)and does not relate to tradtional agriculure. Legislative priorities are focused on health care, jobs, the economy, etc.

What has been done
Cooperative Extension and the Experiement Station have partnerships with many agencies and organizations that have agriculture as a priority. Collaborative work ranges from promoting programs and events, to jointly planning and conducting educational programs, to planning and carrying out research projects, often a result of a joint proposal for external funding.

Results
Among the parterships strengthened were ones with the Connecticut Department of Revenue Services, the U. S. Internal Revenue Service, and private sector tax accountants and attorneys within the state, as a result of the Tax School program; the Connecticut Department of Economic and Community Development (DECD; the Connecticut Department of Agriculture (DOA); Connecticut Farm Bureau Association, Connecticut Green Industry Association, Connecticut Poultry Association, USDA Risk Management Agency, USDA Farm Service Agency, USDA Natural Resources Conservation Service, First Pioneer Farm Credit, , CT Farmland Trust, American Farmland Trust, CT NOFA, City Seed, CT Women's Agricultural Network, CT Grange, a vocational agricultural

center, and representatives of the legal and insurance professions were collaborators in programming for agricultural producers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
603	Market Economics
605	Natural Resource and Environmental Economics
606	International Trade and Development

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
2009	5	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Connecticut weather can be unpredictable - early/late frost, sudden summer hail storms in just one town; non-rainy but no-sun days, etc. Crop insurance options are sometimes limited by crop and county, and understanding deadlines and the costs and benefits are challenging. Conencticut farmers, operating small farms in terms of acreage, need to consider crop insurance carefully in their business plans.

What has been done
The Connecticut Farm Risk Management and Crop Insurance website, www.ctfarmrisk.uconn.edu was maintained listing educational activities, fact sheets, and links to farm risk management resources as a resource for agricultural producers and advisors regarding most farm management issues, with a focus on crop insurance. Information on crop insurance was part of all educational activities and programs, making information readily accessible. A crop insurance/risk management exhibit was included in almost every agricultural commodity meeting, as was as at meetings of the Farm Bureau, CT Northeast Organic Farmers Assocation, the College of Agriculture Corneucopia Festival, etc.

Results
According to federal data, crop insurance liability coverage continues to increase in Connecticut. More producers are finding that crop insurance is worth the investment, particularly for crop loss due to weather.

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
2009	15	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The economic viability and financial profitability of Connecticut agricultural enterprises continues to challenge farmers in an urban state where land and other costs are extremely high. By reducing farm risks such as production, processing, marketing, legal issues, finance, human resources, and environmental management, farmers can better management their financial goals. The use of information and decision-making tools are critical to address issues such as: farm transfer and estate planning, working with local officials, business planning, marketing planning, energy conservation options and transitioning to organic production.

What has been done
A curriculum was developed addressing Crop Insurance and Risk Management Education for Connecticut Producers and Advisors. It covers: goals and objectives, potential speakers, training session format, commodities covered by crop insurance products, specific crop insurance programs, financial record keeping, and crop insurance educational materials.Communications (e-mail/postal) went to 3,020 agricultural producers and 250 advisors 9 times on crop surance information and sign-up deadlines for policies available in Connecticut, crop insurance and risk management educational activities, and upcoming events sponsored by partner organizations.

* Two workshops addressed crop insurance and related topics. Each workshop, entitled "A Risk Management Workshop: Sharpen Your Risk Management Skills", provided information on crop insurance as well as pesticide safety training. A third topic at the first workshop provided information on dealing with local officials. A third topic at the second workshop was estate planning. There were a total of 25 participants including 12 farmers and 13 advisors.
* One-on-One advising sessions for farmers held in four locations addressed crop insurance, farm succession, business and marketing planning, working with local officials, transitioning to organic production, and energy conservation. There were 78 participants including 54 farmers.
* A workshop entitled "Developing a Financial and Marketing Plan for the New Year" was held. This workshop had 33 participants. Topics included information on crop insurance, financial tools, SARE grant programs, CT Department of Agriculture grants and business plans.
* An Agricultural Marketing Tour had a total of 32 participants including 8 farmers learn about a variety of marketing approaches: Farm to School Program, Farm to Chef Program, retail farm stores, and electronic

marketing (email and websites). Two farms were visited as well as a school district.

* A Women's Agricultural Business Planning Summit was held. A total of 65 people attended with 55 producers. Topics included business planning, grants, credit options, and business expansion and diversification.

Results

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 entitties 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
2009	2	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Dairy farms continue to be severely challenged by the high costs of farming in an urban state. Given the general economic situation in Connecticut, a strong case for state support of the dairy industry must be made using sound economic data. This project works to estimate the impact of the dairy industry on the Connecticut economy using input-output models that account for interrelationships between the dairy industry and other sectors as well as imports and exports of products and services. It also evaluates the need for new public policy, particularly pricing ones, to support the state dairy industry and reverse the decline in dairy farm operators and dairy land.

What has been done

A 27 page report entitled "The Economic and Fiscal Impacts of Connecticut's Dairy Industry" was distributed to Governor Rell, all members of the Legislative, and stakeholders including the Connecticut Farm Bureau and farmers. Testimony was given before the Connecticut Legislature at a Special Hearing on dairy policy by Dr. Lopez on the economic impact of the industry and by Adam Rabinowitz on the new for new milk pricing policy in the New England region. Regional radio appearance by Dr. Lopez on the Wayne Norman Show discussing the importance of the dairy industry in the state and of policies to support the industry. Two PowerPoint presentations to 80 dairy industry representatives at the March 16, 2009 conference entitled "Ensuring The Sustainability of the Connecticut Dairy Industry," in Storrs, Connecticut. On presentation was done by Dr. Lopez on "The Economic Impact of the Dairy Industry," and a second presentation by Dr. Cotterill on "The Need for Dairy Policy Reform." Reports can be downloaded online from http://www.fmpc.uconn.edu/research/milk/

Results

The project demonstrated the economic importance of the dairy industry: nearly $1 billion in statewide sales and 4,000 jobs through its own and suppliers and interrelated sectors. This is the first time that such impact is estimated for the state industry as well as spotlighted the value of the Connecticut dairy farm sector in preserving the 72,000 acres of land, including green benefits to the general public that are valued at $55 million a year and that are not reflected in the business impacts. The project provided alternative policy options available to the Connecticut Legislature and the Governor to enhance the economic viability of the dairy industry in the state, that go beyond farming to include the increasingly important value-added industry that locates in Connecticut to supply the Northeast corridor. This provided information in relation to Public Act 08-164, An Act Concerning Assistance to Dairy Farmers, via policy recommendations and proposed legislative changes to enhance dairy farmer revenue as well as providing evidence of the positive impact the dairy industry has on the overall Connecticut economy. The impact report was covered in all major media outlets. The Environment Committee of the State House of Representatives conducted a day of hearings including the outcome of this report in a special session to make policy proposals. Given the ongoing financial crisis, the state is exploring policies to increase dairy farm revenues without taxpayers' money. In addition, Congressman Joe Courtney, U.S. Representative 2nd District-Connecticut, is leading an effort in Congress to bring about regional policies that include Connecticut farmers as beneficiaries in order to prevent the demise of the sector and to preserve open space.

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

Brief Explanation

The cost of land in Connecticut is very high, making agricultural pursuits challenging economically. The agricultural population is aging, and in many towns, (no county government in Connecticut), local zoning and other regulations are not always friendly to agriculture.

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

Agricultural Risk Management:

The Risk Management Team was more consistent in collecting data from participants in team educational activities. The Team has set a goal to collect intermediate outcomes - that is what the participants did 6-12 months after the direct learning event, in the next program cycle.

A Risk Management Workshop: Sharpen Your Risk Management Skills (25 participants) - When asked about their current knowledge of the subject matter before the workshop, the average score was 2.72 (a score of 5 was defined as very high knowledge). After the workshop, the average score was 3.62.

One-on-one Advising Sessions (78 participants) - 94% of responses indicated that their expectations for the sessions were met, and nearly 85% articulated very specific actions they planned to take as a result of the sessions. Examples of plans included:

Will increase size of operation by much larger increment - 3x;
I plan on writing a mission statement, budget from bottom up!
Revisit some past decisions in light of new mission/plan;
Look for someone to transition into our operation;
Establish LLC, will need operation requirements for each individual associated in business.
Protect my parents/ourselves from siblings not in business;
Go to town hall and get a copy of zoning regulations; t
Take information to the town of Lebanon Board of Tax Review;
Will discuss establishing an LLC / my husband and lawyer

Agricultural Marketing Tour (32 participants) - When participants were asked how helpful the program was, the average response was 4.10 out of a maximum of 5. More than half the participants listed specific plans to use information obtained on the tour, such as work with local school to consider participating in the farm to chef program, explore internet marketing ideas, and take online agriculture courses.

Women's Agricultural Business Planning Summit (65 participants) - Of people that submitted an evaluation, 69% rated the day as great, 21% as very good, 7% good and 3% poor (1 person); slightly over half of the respondents listed actions that they planned to take, including setting up a CSA, completting a business plan and searching for grant funds.

Connecticut Shellfish and GIS technology

Pre- and post-training assessments allowed us to evaluate improvement in knowledge of geospatial technologies and assess effectiveness of the instructors and usefulness of training materials. Of the respondents (n=19), 21% had taken a previous GIS course before and 47% reported working with GIS previously, even if just a little. Only one individual had greater than five years experience with GIS, while 15% had one to five years experience, 15% had less than one year of experience and 63% had no experience with GIS. All respondents reported learning new information, with the amount of new information acquired ranging from 60 to 100%. Nearly 95% of the respondents agreed or strongly agreed that this information was valuable to them, and 89% agreed or strongly agreed that the combination of formal presentations followed by exercises worked well.

Sixty-three percent of respondents reported being more familiar ESRI ArcMap GIS software as a result of this workshop, and 95% either agreed or strongly agreed that this workshop helped them gain a better understanding of GIS and its field applications. Without this workshop, greater than half (63%) did not believe that they would have otherwise begun to use GIS for shellfisheries management. Within one month of the workshop, more than half (53%) had reviewed their GIS training materials or were actively using the ESRI ArcMap GIS software. Eighty-four percent agreed or strongly agreed that as a result of this workshop, they were more likely to use GIS for making decisions about shellfisheries management. Municipal shellfish commissions save time and effort through the use of GIS rather than traditional planning methodologies; and Municipal shellfish commissions have a method for archiving and sharing shellfisheries management datasets. More specifically, as a result of this project, eight towns took specific action to address local policies and procedures using GIS technology:

Municipal shellfish commissions have an increased understanding of geospatial technologies and are better equipped to make informed decisions regarding commercial and recreational shellfisheries and

aquaculture;

The Town of Stonington Shellfish Commission modified the siting of one aquaculture project, using GIS to separate the site into two parcels, rendering part unsuitable for shellfish culture, thus reducing the "per acre" fee. GIS provided a quicker, more accurate calculation and depiction of lease acreage/area over the traditional method of using rough calculations based on paper maps, resulting in a reduction in time required to modify the permit, providing cost savings to the grower and reduced effort for volunteer Commissioners. The Commission is also developing a map of the mooring areas.

The Town of Groton Shellfish Commission used GIS to identify and map all watersheds in the town and the associated salt water sub-estuary receiving runoff from each watershed. These maps and associated data provide the basis for calculating the contaminant load reaching each estuary and will enable the development of specifications for maximum tolerable load; this information will factor into planning and zoning decisions.

The Town of Branford developed a GIS map with commercial leases and privately owned beds which allowed them to open new areas for shellfishing and aquaculture activity.

The Town of Westport is conducting a shellfish resource assessment, an outfall survey and a waterfront use survey which will allow them to identify potential impacts to shellfisheries resulting from land-based uses.

The Town of Madison is hiring consultants to work on GIS at the town hall. This will allow them to contribute shellfisheries data to the town for GIS analysis.

The Town of Guilford has updated its recreational and commercial shellfishing lease maps using GIS, as well as created layers for the town's mooring areas and a salinity grid. This will allow them to make more informed decisions regarding future siting of shellfish enhancement and stocking programs.

Key Items of Evaluation

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%		10%	
802	Human Development and Family Well-Being	10%		10%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	10%		10%	
806	Youth Development	70%		70%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	17.0	0.0	2.0	0.0
Actual	22.3	0.0	0.3	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
778133	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
778133	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
403674	0	18770	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Camps, workshops, 4-H clubs, school-enrichment programs, web pages, fairs, conferences

2. Brief description of the target audience

Youth and families.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	4000	1500	24000	3500
Actual	3345	3400	22500	3400

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	4	1	
Actual	4	0	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Presentations and short courses

Year	Target	Actual
2009	80	120

Output #2

Output Measure

- Websites developed

Year	Target	Actual
2009	1	2

Output #3

Output Measure

- Curricula Developed

Year	Target	Actual
2009	1	2

Output #4

Output Measure

- Media Contacts

Year	Target	Actual
2009	20	30

Output #5

Output Measure

- Newsletters and marketing materials

Year	Target	Actual
2009	15	12

Output #6

Output Measure

- After-school programs

Year	Target	Actual
2009	5	20

Output #7

Output Measure

- eXtension committee participation

Year	Target	Actual
2009	1	1

Output #8

Output Measure

- Books and monographs

Year	Target	Actual
2009	0	0

Output #9

Output Measure

- Conference abstracts

Year	Target	Actual
2009	1	1

Output #10

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2009	2	4

Output #11

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2009	10	56

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

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
4-H LIFT (Learning, Interaction, Friends, and Talents) is an after-school program serving students in grades 5-8 who attend Windham Middle School, Willimantic, CT. Willimantic is a small city, very urban, with a large Hispanic population, chronic unemployment, and much illegal drug use. The need for positive role models, mentors and youth activities is great to break the cycle of poverty. This year 4-H LIFT enrolled 110 students, including high school students who volunteered with the program. 4-H LIFT provides a safe and structured place for students and creates multidiscipline learning partnerships that enhance the lives of adults and youths. 80% of the participants are below the poverty line.

What has been done
Undergraduate students from the University of Connecticut (UConn) and Eastern Connecticut State University (ECSU) staff the afterschool program. Extension 4-H Educators provide supervision. The Center for Community Outreach (CCO) Student Leader position with 4-H LIFT has proven successful in increasing visibility on campus and recruiting quality staff. Recruitment efforts highlight 4-H LIFT employment opportunities for student leadership in areas including: Art, Kinesiology, Education, Engineering, Human Development and Family Studies, Math and Nutritional Sciences. The CCO continues to provide student transportation for LIFT at no charge to the program.

Results
4- H LIFT 6th graders participated in the All Stars(tm) program which establishes positive norms and building strong personal commitments. The program ends with a special celebration attended by many parents. At the celebration the students receive All Stars(tm) T-shirts and rings. The students played a video presentation of their goals and aspirations. Of special note was that one student, who it had been brought to our attention had been struggling with peer social interactions, was given the only round of applause from the students for her remarkable presentation. 4-H LIFT 7th graders, last year's sixth grade students, engaged in an All Stars follow-up program, to reinforce lessons learned in the first year of the program. 4-H LIFT 7th and 8th graders participated in a drug and alcohol awareness program, and painted a mural depicting positive lifestyle choices. A community service project featured Talking With TJ, a 4-H in the classroom educational program designed to improve the teamwork skills of second through fourth graders. The program used a creative mix of videos and hands-on activities to teach skills. 4-H LIFT students created and executed the program, serving as facilitators for the elementary students.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
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
2009	15	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Connecticut ranks 2nd per capita in horse density with 1 horse for every 65 people. There are approximately 400 horse shows per year in Connecticut helping to generate a 333 million-dollar annual revenue. The 4-H Horse Program helps initiate and educate 4-H participants to all aspects of horse involvement through an applied academics approach to horse science and managmement. There are over 1000 4-H horse projects members in Connecticut, (more than dairy, beef, sheep, hogs and poultry combined) representing the largest single project area enrollment. 765 girls and 214 boys between the ages of 7 and 19 are currently enrolled in the 4-H horse program. There are 140 adult volunteers who are active in the 4-H Horse Program.

What has been done
The focus of the State 4-H Horse Program are the State 4-H Horse Academic Events. 4-H members have the opportunity to be evaluated on and display their academic skills in hippology, horse judging, and equine quiz bowl, team demonstrations, individual demonstrations and public speaking. Events combine fun with learning and sharing and where youht could be challenged and evaluated, and social interaction between 4-H horse participants from all over the state would occur. Sound study habits that will help members achieve not only in 4-H but in life are stressed. As 4-H members learn about the horse industry they will contribute to the success of theindustry as well as We increases interest in equine studies at the college level, leading to more productive employment. Academic 4-H experience will help them be more ecologically sound in their horse management practices.

Results
The 2008/9 State 4-H Horse Contests had over 150 combined participants. The contests increased all participants' knowledge of the subject matter, promoted friendships between 4-H members from all over the state, and provided members with feedback on how their studies were proceeding. Four of the top teams and 4 individual speakers from the State 4-H Horse Contests were offered the opportunity to compete on the national level in Kentucky. They worked hard and did very well in the national contest. The study habits that are formed by the participants can be applied to their schoolwork. Many contestants commented on how studying for state

contest has greatly improved their ability to retain information for other school subjects. Creating a positive learning and sharing situation can greatly improve a participant's self-confidence in the academic arena. This too can improve their self-image and academic standing in school.

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)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Involvement in workforce preparation projects provide youth with challenges, experiences, support and help which promote positive and realistic outlooks on the world of work. It also fosters the development of skills (SCANS) recognized as critical for entrance into the workforce. Youth involved in 4-H workforce readiness programs learn and practice skills that employers want and need in employees- regardless of the position. Skills such as- creative thinking, decision making, problem solving, knowing how to learn, responsibility, self-management, integrity/honesty, dependability, punctuality, participates as member of a team, works to satisfy customers' expectations, and works well with men and women from diverse backgrounds. Danbury is a city that has chronic unemployment, a very diverse population, and is concerned for the future of its youth.

What has been done
In conjunction with the City of Danbury, Fairfield County Extension Council, Fairfield County 4-H Development Committee, programs focusing on youth employment and careers included: STEP-UP! - A Workforce Readiness Program for Teens was a pilot 6 week summer work training programming for teens with limited resources. It was a youth centered "train the trainer" program in which teens were trained to present Healthy Lifestyles activities to younger children who attended summer camps. By working in teams with an adult facilitator, youth learned valuable skills that are important in school, as well as critical to success in the workplace: reading, public speaking, leadership, personal responsibility, decision making, goal setting, attendance, teamwork, creative problem solving, & critical thinking. Work ethic skills such as punctuality, proper grooming and dress, & respect were also a critical part of the program. STEP-UP! had three components: work training, employability skills development and career exploration. In the work training component, teens developed and taught Healthy Lifestyles activities to day campers in the greater Danbury CT area. During the employability portion of STEP-UP!, the business community provided workshops and activities in topics such as interviewing, resume writing, winning applications, job interests, success on the job, budgeting, banking and financial management. STEP-UP!'s career exploration section broadened the horizons of teens with career investigations to local businesses and universities.

Results
Teens learned employment-related skills as well as taught healthy lifestyles to 600 youth in a summer camp program. 119 teens participated in business training conducted by Cooperative Extension 4-H and the business community. In the later program, 71% learned that a performance appraisal is similar to a report card; 85% learned that it's important to be on time for your job; 77% learned the proper way to shake hands and introduce myself at an interview; 78% learned how to budget my money so that I have enough for expenses; 73% learned the different types of bank accounts; 83% learned the importance of saving money; 76% learned the types of products and services a bank offers and 76% learned that I can do more things than I thought I could.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
806	Youth Development

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
2009	20	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In order for youth to develop into adults of integrity who are coping, caring, competent and contributing members of society, they need the opportunity to interact with youth and adults who are role models in a variety of settings. A safe, quality educational camp experience enables youth to develop skills such as decision making, cooperation with others, self reliance and leadership. Many youth who do not flourish in traditional school settings find success and feelings of accomplishment in the more informal camp setting. As the structure of the family has changed, parents need a place where they know their children are getting what they need. Volunteers who serve on 4-H camp boards are extremely dedicated and interested in doing what is best for youth and camp. Most often they lack the skills needed to serve effectively on a volunteer board and the knowledge of camping standards. With training and support they can run exceptional camp programs.

What has been done
A group of 18 representatives from five Connecticut 4-H camp foundations has demonstrated that they have learned skills to work together and network by attending meetings to plan a comprehensive staff training conference. They have increased their networking skills as evidenced by the increase in calls they have made to each other, requests they have made to the Extension Educator, and practices they have adopted from other

camps. Other foundation members have also learned these skills. They were also emailed educational material at least monthly. Training conferences, both in the state and throughout New England provided education in workshops and peer to peer sessions. In depth consultations on camp practices were provided for a CT Girl Scout day camp and a CT YMCA day camp.

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Results
100 CT 4-H camp staff completed a comprehensive training conference program increasing their skills in working with youth and demonstrating that throughout the summer. 25 Staff at the Hartford County, CT 4-H Camp participated in leadership training. 12 4-H Connecticut Camp Administrators increased their skills in camp management through a facilitated roundtable discussion. 15 Camp Professionals learned more about Volunteer Board Development through attending a workshop taught by the Extension Educator at the Conference of the New England Region of the American Camp Association in Manchester, NH. 32 Camp Professional learned more about Empowerment of Counselors and Leadership Skills through attending a workshop taught by the Extension Educator at the Conference of the New England Region of the American Camp Association in Manchester, NH.

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 Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
An opportunity to bring together communities, youth development education, and the growing movement toward local food resulted in the re-introduction of the Junior Master Gardener program in Connecticut. Many young people are unfamiliar with how food is grown as Connecticut is an urban state. At the same time, the emphasis on local food is also an opportunity to encourage better nutrition for youth and families.

What has been done
Over the past two year, the Junior Master Gardener (JMG) program been widely promoted throughout the state. The program was presented to existing master gardeners, area schools, 4-H clubs, community organizations, public libraries and camps. Through this effort JMG clubs were started along with short term Golden Ray Series programs at Otis Public Library in Norwich and a special two week program at the Windham-Tolland 4-H Camp. The project team is working with EASTCONN [a regional office of the state department of education] to create a train the trainer program to meet state educational standards. This program is now offered to area teachers with continuing education credits. Additional camp programs are underway.

Results
Though the direct economic impact is not known, program participants learn to produce food for family consumption and support the local horticultural and agricultural economy. Many new partnerships resulted in an increased knowledge of Cooperative Extension and 4-H youth development in communities across the state - literally from border to border (Putnam to Newtown). Among them were The Hawley Elementary School Junior Master Gardener Club - Southbury, CT - 16 youth participants; Rockville Kids Grow - Vernon, CT - 13 youth participants; Television Channel 3 Kids Camp - Andover, CT reaching out to several hundred youth each summer; Sue's Kids 4-H Club - Putnam, CT reaching out to over 50 at risk children at the Putnam Housing Authority with the JMG Health and Nutrition from the Garden Golden Ray Series; Literature in the Garden Golden Ray Seriesat Otis Library - Norwich, CT - 10 participants; Operation W.A.T.E.R. JMG Program - Windham-Tolland 4-H Camp, Pomfret Center, CT - 15 youth participants; Chaplin Elementary School JMG Club - Chaplin, CT - 38 youth participants; Oak Grove JMG Club at the Lutz Children's Museum- Manchester, CT - 20 youth participants; Middle Gate Elementary School Greenthumbs - Newtown, CT -28 youth participants.

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

2009	10	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

When parents in either the active or reserve military are mobilized, children and families face many new challenges. Connecticut Operation Military Kids is a grant funded program ($90,000) that provides education and support to military families through four core components: Ready, Set, Go!, Speak Out for Military Kids, Hero Packs, and the Mobile Technology Lab. Operation Military Kids is a national effort to support children of service members and their families during deployment. This is achieved by developing a network of support through military and civilian agencies and people located in individual communities throughout the state.

What has been done

UConn CES developed a team of collaborators representing several branches of active and reserve military including the U.S. Navy Submarine Base in New London, the Connecticut National Guard, the Army Reserve Child and Youth services, the American Legion Auxiliary, the American Legion, Army OneSource, and Military OneSource. Non-military collaborators include 2-1-1 Child Care, the Boys and Girls Club, and UConn Cooperative Extension 4-H and Youth Development and Family Programs. The Connecticut OMK Team delivered the four components of OMK and informed military families and the public about OMK and the plight of military families. To date, they have added Connecticut to the national website and informed military families about OMK events. They conducted a Ready, Set, Go! In-Service training for Connecticut State Department of Education Officials and Military Personnel. They have informed military families about OMK at several events adn delployments at the Hartford Armory and at an event sponsored by the Governor's Horse Guard. During April, the 4-H Youth participating in 4-H Citizenship Day learned about OMK. 4-H youth are assembling Hero Packs or back packs filled with special items for children whose parents are deployed. Cumberland Farms has also allocated a grant for $1,400 for Hero Pack items.

Results

Connecticut OMK has reached more than 350 children and families across the state, as well as worked with many new partners, resulting in increased publicity, referrals and funding. OMK presented an exhibit at the State Legislative Reception at the Capitol in Hartford to the Connecticut legislators. OMK is preparing the Mobile Technology Laboratory to be used at OMK events. The MTL allows children and families to communicate with loved ones who are deployed; and enables non-military children and adults to communicate with deployed service members as well. When CT OMK receives a request, the appropriate military partner is directed to provide information to people with inquiries. A major benefit is that the CT OMK brings military and non-military collaborators together, many of whom had never met or realized what each partner agency can offer for education and/or services to youth and families.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Competing Public priorities

Brief Explanation

Youth programs depend on volunteeers, and with the economic situation, more families find that extra time needs to go to paid employment, leaving less time for volunteering.

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)
- Other (Project reports)

Evaluation Results

SUMMER YOUTH EMPLOYMENT PROGRAM UConn STEP-UP! - Teaching Healthy Lifestyles
Teens in the Summer UConn STEP-UP! Program - All participants (100%) reported that they

Learned the importance of listening
Learned the importance of cooperation when doing a job
Learned how to become a better listener
Learned how to manage the lesson time effectively
Learned how to lead the activity effectively
Increased their knowledge in nutrition
Increased their knowledge in healthy choices
Increased their knowledge in environmental stewardship
Learned that after receiving criticism, one must make an effort to improve/change a behavior
Learned how to add or subtract things from the lesson as time permits
Learned how to solve problems in preparing the lessons
Learned how to use the visuals effectively when teaching
Learned ways to teach the lessons to different ages of day campers
And 83% reported that they Learned how to speak to campers in a loud and clear voice and
Learned how to dress appropriately for my job
What did you learn from working on a team?
People's strengths and weaknesses
I learned how to be a team player
You have to decide what your roles are/give other people a chance to lead
I learned that you have to cooperate a lot with your team members
Everyone has to put in work

What new thing did you learn about yourself?
I learned that I know how to speak when teaching the kids.
I like teaching younger children, but older kids are easier
I learned that I can take initiative and responsibility and that I can be like a leader and teach people
Good at public speaking
I learned that I know how to handle young children
That I work great with kids

What have you learned about teaching elementary school children?
That it is a lot of work
The children are exciting to teach they understand what we teach.
Patience
You have to be positive/energetic. Practice your lessons and make it fun for them
I learned that not all children learn the same way, you have to be patient and adjust to the different kids and the different ages.

What have you learned about preparing lesson plans for elementary school children?
It's hard because sometimes your mind could be a blank when trying to learn the lessons.
It takes a lot of work
Bring it to their level

It takes a lot of work to prepare the lessons but while you're teaching you might have to change it and adjust it at the last minute

Describe your three best employment related qualities?
Being on Time
Hard worker, reliable and strong leader.
I learn quickly, I try my best to be responsible and focus
I have a good attitude & I consider myself a people person
Leadership and Initiative
I'm responsible, hardworking and very punctual

In what work related area did you make the most improvement?
My communication was the most improved
Coming up with new ideas
Responsibility
I improved my organizational skills

Youth Employability Training
Teens in the City of Danbury Summer Youth Work program report they:
71% Learned that a performance appraisal is similar to a report card
85% Learned that it's important to be on time for your job
77% Learned the proper way to shake hands and introduce myself at an interview.
78% Learned how to budget my money so that I have enough for expenses.
73% Learned the different types of bank accounts.
83% Learned the importance of saving money.
76% Learned the types of products and services a bank offers.
76% Learned that I can do more things than I thought I could.
85% Learned that it's important to be on time for your job.
79% Learned the importance of cooperation when doing a job.
77% Learned ways to be a better team member.
67% Learned how to work with people that I don't always like
78%. Learned that being absent or tardy can jeopardize my job.
76% Learned how to complete a job application
72% Learned the proper way to shake hands and introduce myself at an interview.
72% Learned that my decisions and choices affect my finances
72% Learned that males can be sexually harassed.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

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	40%		40%	
124	Urban Forestry	20%		20%	
135	Aquatic and Terrestrial Wildlife	40%		40%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	2.0	0.0
Actual	1.7	0.0	1.8	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**
48516	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
48516	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
126797	0	232018	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The primary activity was training volunteers and municpal officials to become engaged in forest stewardship practices at the municipal and private landowner levels.

2. Brief description of the target audience

A mixture of public policy personnel (federal and state agencies as well as town conservation, planning and management officials), interested and involved citizens, and private landowners, as well as non-governmental organizations.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	3000	5500	0	0
Actual	3500	5000	0	0

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

Patent Applications Submitted

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	1	1	
Actual	1	1	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2009	5	45

Output #2

Output Measure

- Short courses

Year	Target	Actual
2009	2	5

Output #3

Output Measure

- Websites developed

Year	Target	Actual

2009	1	1

Output #4

Output Measure

- Books and monographs

Year	Target	Actual
2009	0	0

Output #5

Output Measure

- Conference abstracts

Year	Target	Actual
2009	0	1

Output #6

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2009	2	78

Output #7

Output Measure

- Presentations and short courses

Year	Target	Actual
2009	45	52

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of governmental and/or private sector entitties 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 behavoir (# of patterns and/or behavoirs)

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15	70

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Geospatial technologies include geographic information systems (GIS), global positioning systems (GPS) and remote sensing and image classification (RS). Collectively, these technologies provide power tools for data creation, analysis and management, especially in the area of natural resources and land use. However, effective use of the technologies is limited due to a lack of trained professionals and a lack of understanding on the part of many potential users about how GIS, GPS and RS can be used to improve decision making and resource/land management. The focus of the Geospatial Technology Program (GTP) is to develop and offer learning opportunities for municipal land use decision makers, state agency resource managers and other individuals and organizations involved in natural resource management and land use planning.

What has been done

The GTP is supported by the University in the form of facilities. Additional external support, has come fNASA, the Institute for the Application of Geospatial Technology, the UConn Institute for Water Resources, US Forest Service and the Connecticut DEP. Programs this year: 3-day introduction to GIS -"Geospatial Technologies at Work" which is offered 5 times/year; 2-day introduction to GPS - "Pictures, Points and Places" which is offered 6 times/year. This course was developed in collaboration with the UNH GTP and is now being adapted for use at URI as part of URI Extension's geospatial outreach; Six advanced 1-day GIS courses that are being offered 2 times/year and that include "ModelBuilder," "Python Scripting," "Making Good Maps," "Creating and Editing GIS Data," "Mashups" and "Imagery and Remote Sensing." The courses are taught at the Middlesex County Extension Center using a "mobile lab" consisting of 16 high-end laptop computers purchased using funds raised through course fees charged by the Geospatial Technology Program. In collaboration with GTP, two specialized 2-day geospatial technology courses on coastal applications were taught at Avery Point by instructors from the NOAA Coastal Services Center.

Results

Approximately 225 individuals participated in one or more of the GTP's hands-on geospatial training classes. Based on the results of post surveys, participants reported that their skill levels were significantly greater and would use skills productively. The Connecticut Environmental Review Team now publishes geotagged pictures of its environmental reviews on its web site using methods taught in the GTP class Pictures, Points and Places,making it possible for CERT clients and others to access and visualize information faster than waiting for published reports. The Madison Land Conservation Trust has begun to document its land holdings and easements with geotagged photographs for improved long-term property management.Epidemiologists in the

Connecticut Department of Health Services who took the GTP class Geospatial Technologies at Work are now regularly using GIS for program planning and analysis. One student reported that since learning how to use GIS she has become the office GIS guru and is constantly be asked by her colleagues to prepare maps for their projects.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
124	Urban Forestry

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
2009	5	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
For nearly a century Connecticut state law has mandated that each city and town appoint a Tree Warden and that this public official is then responsible for all municipal trees. However, Connecticut state law does not specify what skills and knowledge Tree Wardens must posses. To protect both the public and the urban forest resource, Tree Wardens need knowledge of tree biology, tree care, hazard tree assessment, public participation, tree law, and meeting management. An annual Tree Warden School and Certification Program was created to provide Tree Wardens with a voluntary educational opportunity to acquire this knowledge. Currently there are several invasive insect species that may impact Connecticut forests in the next year - one Massachusetts city less than 20 miles from the Connecticut state line cut 26,000 trees due to the Asian Longhorn beetle in 2009. Tree wardens need up to date information in order to protect trees in their towns.

What has been done
An annual Tree Warden School and Certification Program provides Tree Wardens with a detailed learning opportunity through the collaboration of the Cooperative Extension urban and community forester, Connecticut Department of Environmental Protection, Division of Forestry and the Tree Wardens' Association of Connecticut, Inc. Tree Wardens learnedree biology, tree care, hazard tree assessment, public participation, tree law, and meeting management during six half-day sessions, one day per week in the fall. The annual Tree Warden School each year provides up Tree Wardens, Deputy Tree Wardens, chief elected officials, tree board members and others with the knowledge and skills required to perform and/or understand Tree Warden duties and responsibilities.

Results

Connectiuct now has 300 Tree Wardens, Deputy Tree Wardens and others with new and current knowledge of Tree Warden duties and responsibilities through. Thus, Certified Tree Wardens are now better able to make informed and responsible decisions about the care and preservation of public trees while protecting the public from hazardous ones. A significant, yet unanticipated outcome of this program is town officials are appointing more qualified people to the Tree Warden position; more are foresters or arborists who attend the Tree Warden School to fill-in gaps in their expertise and obtain certification. This program is serving as a model for the urban and community forestry program efforts in Maine and Vermont.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
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
2009	5	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Connecticut is the fifth most densely populated state yet retains fifty-nine percent forest coverage. This extreme population density causes factors that not only shorten the lives of municipal trees (along streets, in parks, around schools, for example) but also creates hazardous ones. In spite of being a wealthy state, Connecticut municipalities typically do not adequately fund municipal forestry/tree care operations thereby undermining the health of public and jeopardizing public safety. Volunteers who are receive quality and timely community forestry education and training are able to augment community forestry efforts

What has been done
The urban and community forestry volunteer initiative is a collaborative effort with the USDA Forest Service, State and Private Forestry (USFS), the Connecticut Department of Environmental Protection, Division of Forestry, the Connecticut Urban Forest Council and Connecticut College. A three-day, two-night training weekend is held annually. Volunteers learn the latest in urban and community forestry including tree biology, tree care, fundraising, media relations, community affairs, meeting management, tree law, and marketing.

Results
More than 300 urban and community forestry volunteers have been trained over the life of the project. Participants have come from 81 Connecticut communities and three states. During the life of the program, volunteers have been the initiator or participant in the following outcomes: 44 communities have written and passed shade tree ordinances; 30 shade tree commissions have been established; about 7,329 new public trees

have been planted; twenty-five cities and towns have conducted volunteer organized shade tree inventories; three nonprofit community forestry organizations have been founded; and seven municipal memorial tree programs have been created.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
124	Urban Forestry

Outcome #4

1. Outcome Measures

Stewardship Plans Developed

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10	28

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Over 1,800,000 acres or 58% in Connecticut are forests - a very high amount in a very urban state. Forests contribute to the quality of life and economy by protecting public and private water supplies, support a 700+ million dollar annual forest products industry, provide the backdrop for a growing recreational and tourist industry, and wildlife habitat. 83% of forestland is privately owned by individuals and groups, comprising more than one-half the land area. The state's forest resources are held by an increasing number of individuals with increasingly diverse ownership objectives. Forests are threatened by parcelization, conversion to other uses, and fragmentation resulting from population pressures. Insects, diseases and invasive species are also significant threats. These factors are especially significant in rural communities such as in the northwest CT Highlands Region where the forest cover provides the primary source of and protection for clean surface and groundwater resources. Research on forest health issues, assistance to forest landowners, and general public education can insure that forests are better managed, healthier and more productive.

What has been done
The Forest Stewardship Educator, and the GIS Educator, in partnership with USDA Forest Service,CT-DEP Forestry Division, CT Forest and Park Assn., Nature Conservancy, Housatonic Valley Assn., land trusts, landowner associations, and Tree Farm Program, Coverts Project)provided: a Forest Stewardship Short Course for Landowners conducted in cooperation with CT-DEP Forestry Division and CFPA. Course materials, map sets and Stewardship Planning guidelines were provided for each partcipant. 28 participants attended. Two major conferences/workshops were organized, planned and presented for 150 CT Certified Foresters. Over 20 presentations were made to community groups, etc. Forest Stewardship Planning assistance was provided to 32

individuals.A web based, stand-level mapping tool was completed and is available for state forestland and wildlife habitat managers.

Results
Twenty eight landowners with a combined acreage of just over 3010 acres completed Forest Stewardship Plans, and additional landowners have applied for enrollment in the program, but plans are not yet complete. The additional acreage represents an increase in the amount of acreage under stewardship plans to over 64,000 acreage. An estimated 70% of newly enrolled Stewardship landowners planned or conducted management activities on their properties. Forest harvesting activities on Forest Stewardship Program properties generated millions of board feet and thousands of cords of commercially valuable forest products. Over 150 volunteers participated in Forest Stewardship, Tree Farm or Highlands Project Public work group sessions. Over 150 icensed and certified forest practitioners obtained continuing education credits from workshops, conferences and seminars. Commercial forest products transactions from properties enrolled in Forest Stewardship produced an estimated $750,000 contribution to the state economy. This number represents only a fraction of the total forest products harvested in CT, but can be considered a sustainable economic contribution, from well managed and continuously productive forest land. Land enrolled in the Forest Stewardship Program represents an additional 4% of CT's forest resource that is being managed in a sustainable fashion.

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

Increased understanding of fish and wildlife population patterns and/or behavoir (# of patterns and/or behavoirs)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The lower Connecticut River tidal wetlands complex became a Ramsar Wetland of International Importance in 1994. Such wetlands are designated as internationally important under the Convention on Wetlands (Ramsar, 1971). Since 1994. however, awareness of this area as a system has diminished as individual towns and schools focus within their municipal boundaries or regions. The wetlands are an important factor in the health of Long

Island Sound. The objective of this program was to raise public awareness of this internationally significant estuary as a system and help residents and teachers learn about the habitats, species, processes and values of the Connecticut River estuary.

What has been done

The UConn Department of Extension worked with a grant from the US Fish and Wildlife Service (USFWS) Wetlands without Borders Global program, and collaborated with Project Oceanology, and the Connecticut Dept of Environmental Protection Office of Long Island Sound Programs . A novel approach, two boat cruises,were provided for nearly 50 municipal officials and middle/high school teachers in the towns bordering the lower river to directly experience and view this area as a system. Nearly 100 members of the general public attended lectures on the geology and biology of the area. A CD-ROM on the natural resources of the tidal marsh complex was developed and distributed to middle/high school teachers in the towns along the lower river. Middle/high school students participated in a poster contest incorporating World Wetlands Day and the lower CT River marshes. The teacher cruise was assessed through an on-line survey, receiving "Excellent" or "Very Good", ratings, many teachers planning to incorporate information about the lower Connecticut River into their curricula.

Results

Students within the lower Connecticut River town have a greater understanding and appreciation of this tidal marsh complex and its important to Long Island Sound as teachers incorporate all or parts of the CD into their curricula. Teachers rated the CD "good" to "excellent" in terms of being able to incorporate it into their current curricula. In thanking UConn staff for holding the poster contest, the teacher whose student was the grand prize winner, told UConn staff that winning such an award has a tremendous positive impact on a student. Two students who participated on the cruise made a 1 minute news video for Fox TV 61 news. Their video about the Connecticut River won an award for best Environmental Story. The students won $750 college scholarship awards.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

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)

Evaluation Results

Over the past year approximately 225 individuals participated in one or more of the GTP's hands-on geospatial training classes. Many of these people are now working with and productively using GIS technology in their respective organizations. Based on the results of post surveys, the vast majority of individuals reported that their skill levels were significantly greater and that they felt they could begin to productively use skills acquired through the courses.

Several examples of successful integration of geospatial technology methods into ongoing programs, following GTP training courses, include:

The Connecticut Environmental Review Team now publishes geotagged pictures of its environmental reviews on its web site using methods taught in the GTP class Pictures, Points and Places. This makes it possible for CERT clients and other interested parties to access and visualize information in a much more timely fashion that waiting for published reports.

The Madison Land Conservation Trust has begun to document its land holdings and easements with geotagged photographs using methods taught in the GTP class Pictures, Points and Places. Land Trust members have reported that these techniques will be critically important to their long-term property management.

Epidemiologists in the Connecticut Department of Health Services who took the GTP class Geospatial Technologies at Work are now regularly using GIS for program planning and analysis. One student reported that since learning how to use GIS she has become the office GIS guru and is constantly be asked by her colleagues to prepare maps for their projects.

As a result of attending a presentation on Internet mapping that was given by several GTP team members at a Connecticut GIS User to User Network meeting, staff of the UConn Map Library e-mailed to say how they were excited and energized by what they had learned. As a direct result, a First Year Experience Course on Mash-ups and a faculty in-service training are planned at UConn.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

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: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	9.0	0.0	7.0	0.0
Actual	7.2	0.0	11.8	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**
118948	0	16065	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
118948	0	16065	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
465133	0	1051029	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research and Extension addressed issues related to land use and land cover through GIS and other technology. Programs were presented to community officials and the public through workshops, training conferences and other activities.

2. Brief description of the target audience

Public policy decision makers, including federal and state level agency personnel, town and regional personnel associated with land use decision making, academic researchers and Extension personnel at the state, regional and national level.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	500	1300	0	0
Actual	2300	1500	0	0

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	3	4	
Actual	3	6	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2009	10	12

Output #2

Output Measure

- Web sites developed

Year	Target	Actual
2009	1	2

Output #3

Output Measure

- Presentations and short courses

Year	Target	Actual
2009	55	85

Output #4

Output Measure

- News releases and media appearances

Year	Target	Actual
2009	15	20

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2009	0	0

Output #6

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2009	2	15

Output #7

Output Measure

- Conference abstracts

Year	Target	Actual
2009	1	1

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
2009	30	35

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Land, water and people come together to form the regional landscape found mid-northeast area known as the Highlands. Stretching from northwestern Connecticut across the Lower Hudson River Valley of New York, through northern New Jersey to southeastern Pennsylvania, this region contains nearly 3 ½ million acres of forests, farms, and communities. The careful protection, management, and use of the natural resources located in this nationally significant region are essential for the long-term sustainability of both the natural and built environments that nurture all life for both current and future generations. The Extension component for Connecticut Highlands Project provides technical assistance to project partners in geospatial analysis, mapping and agricultural census review. Project partners include the USDA Forest Service, CT DEP, Yale University, Housatonic Valley Association and Regional Planning Agency. The project provides data for the Connecticut portion of the study.

What has been done
The first phase of the study involved an assessment of conservation values and determined where in the Highlands high natural resource values are found. The recently completed second phase of the study has analyzed the pattern and rate of land use change in order to model future growth. Results of the growth analysis provide the basis to model changes in the quality and quantity of the region's water resources. Implications of change for other Highlands resources have also been analyzed. The study also involves the public and stakeholder groups in a collaborative process to achieve a common understanding of the issues, challenges, and the most promising strategies to conserve resources in a region undergoing rapid and extensive land-use change. (120 people participated in listening sessions.)

Results
Measurable objectives for the Extension component of the Connecticut Key outcomes of the Highlands project include the map series and data sets available to the public. Emerging technologies, including remote sensing, GIS and database management and modeling are utilized in a high priority manner in the Connecticut Highlands Project to assess conservation values and inform the process of land protection. This is an on-going project.The primary indicator of the success of the CT Highlands project will be in how landowners, communities and non-profits use the information contained in the draft report. Priority lands have been identified for protection efforts and funding. The CT Highlands Project Conservation Values Assessment and public input process will serve to inform the process for allocating up to $10 million annually in federal funds for conservation efforts in the NY-NJ-

CT-PA Highlands Region. A new research endeavor, the Forest Health Protocol project has been initiated, partially as a result of the information available from the CT Highlands Project.

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

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	20	21

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Land use decisions in Connecticut are made at the local,[town level - there is no county government] municipal level, by volunteer land use board members who are appointed or elected. These critical decision makers have no formal training available to them, nor does the state require any training or level of expertise for their membership on these boards. A 2005-2006 study by the CT Office of Policy and Management, comissioned by the Legislature, concluded that regular, basic training of new land use officials was sorely needed, and that UConn CLEAR was the best situated and most suitable organization to perform this function. The 2008-2009 academic/fiscal year represents the third full year of Academy instruction.

What has been done
The basic "core" Land Use Academy sessions are comprised of three courses, on a Saturday, held four times in various locations around the state. 239 commissioners representing 109 towns (64% fo the municipalities in the state) completed the course. In addition, a statewide conference was held with presentations from partner organizations, including CT Dept. of Environmental Protection, CT Bar Association, CT Partnership for Strong Communities, American Farmland Trust, CT Maine Street, and the CT Dept. of Public Health. The Academy website was also redesigned and enhanced.

Results
With continued funding, we hope to institutionalized the four annual regional trainings and annual conference, reaching an ever-increasing number of local land use decision makers from the state's 169 municipalities. This year, 91% of Academy trainees were "satisfied" or "very satisfied" with the course, and the majority indicated plans to use the information in local decisions about land use.

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
2009	3500	3850

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
At night Last Green Valley in Northeast Connecticut appears distinctively dark amid the urban and suburban glow when viewed from satellites or aircraft, to the point that airline pilots use it as a directional tool. In 1994, Congress designated the 1085 square mile area as a National Heritage Corridor. Comprised of 35 rural towns, with 250-300 year old historic village centers, the region, located within the east coast megalopolis, has been under increasing development pressure in recent years. Communities lack professional planning staff and have limited capacity to address land use, community growth and conservation issues. Land use decision-making is done largely by volunteer boards and commission without any training. Needs assessment surveys in 2000 & 2005 were done w/land use decision-makers, large landowners and land trusts Top topics of interest included open space and natural resource protection, creative forms of development and innovative zoning techniques.

What has been done
Collaboration between the Quinebaug Shetucket Heritage Corridor, the University of Connecticut, the University of Massachusetts, the Nature Conservancy and the Connecticut Department of Environmental Protection resulted in nearly $400,000 in funding. The Green Valley Institute, the public persona of the collaboration, hosted 60 workshops over the past year. Examples of workshops include: 1. Development Strategies that Protect Workshop series - a) Brownfields Redevelopment; b)transfer of Development Rights: Making it Happen. 2. Community Visioning Workshop series - Facilitated and led 3 sessions in Coventry, 4 sessions in Chaplin and one in Ashford. These sessions are held as a community is preparing to update its Plan of Conservation and Development - to get input about the future of the community upfront. 3. Eastford Zoning Study Committee - Developed presentation about the benefits of zoning and facilitated discussion about what's important to Eastford. Eastford is one of two towns in CT that still do not have zoning.

Results
Examples of results: 2 towns received NRI maps; 4 towns developed co-occurring resource analysis; Landowners protected 8,342 acres since 2001; 13 new Conservation Commissions since 2001. Coventry , Chaplin and Ashford (Connecticut) have utilized community input about their future to use as they update their Plan of

Conservation and Development.(POCD's). Coventry has developed design guidelines for the Route 44 commercial corridor. Chaplin is developing a river corridor overlay district and agriculture-friendly regulations as they complete their POCD update.

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 Programmatic Challenges

Brief Explanation

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

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	20%		20%	
201	Plant Genome, Genetics, and Genetic Mechanisms	10%		10%	
202	Plant Genetic Resources	20%		20%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	10%		10%	
205	Plant Management Systems	40%		40%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	10.0	0.0
Actual	9.4	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**
219970	0	17262	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
219970	0	17262	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
416700	0	799928	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research, demonstration sites, Extension workshops, conferences, field days/tours

2. Brief description of the target audience

Agricultural producers, industry associations, consumers

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	3000	12000	0	0
Actual	5000	12000	0	0

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

Year: 2009
Plan: 1
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	2	5	
Actual	2	9	11

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Fact sheets, brochures and newsletters

Year	Target	Actual
2009	35	35

Output #2

Output Measure

- Web sites developed

Year	Target	Actual
2009	1	2

Output #3

Output Measure

- Presentations and short courses

Year	Target	Actual
2009	50	65

Output #4

Output Measure

- News releases and media events

Year	Target	Actual
2009	35	51

Output #5

Output Measure

- Books and monographs
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2009	4	35

Output #7

Output Measure

- Conference abstracts

Year	Target	Actual
2009	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 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	25	28

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The use of organic products in the management of turfgrass is becoming more and more common. The trend has quickly reached athletic field management in the state of Connecticut with the ban of all lawn care pesticide use at public and private schools grades pre-K through 8, effective July 1, 2009. While many organic products have shown their effectiveness when used as part of a comprehensive turfgrass 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. Research on options is necessary to facilitate the compliance with the ban.

What has been done
The effect of organic management practices on turfgrass quality and playing surface characteristics (i.e. traction and surface hardness) was compared to more traditional management practices (i.e. synthetic fertilizers and pesticides) and an untreated control in field trials.

Results
Turfgrass color data indicated that the organic and synthetic management regimes produced similar results. The organic products did have a slightly slower release in the early summer, and some products demonstrated lower color ratings late in the fall. In terms of traction and surface hardness, no individual management regime stood out from the others, and all provided acceptable ranges for each parameter. Weed count data suggested that the synthetic pre-emergent herbicide, Dimension, was significantly more effective at preventing crabgrass infestation than the organic product, corn gluten meal. The percent turf cover data showed that with the exception of the organic protein + biologicals regime, the organic and synthetic treatments perform quite similarly. More importantly, overseeding proved to be an effective means of increasing turf cover and quality during traffic. In general, some form of fertilizer input, whether synthetic or organic, proved necessary to provide better results than no fertility applications.

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
2009	15	16

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Turfgrass represents one of the largest agricultural commodities in the Northeastern U.S., and the industry is growing rapidly in response to increasing urbanization of the region. Best management practices for turf need to be developed and implemented to minimize the threat of water pollution from turfgrass fertilizers. A portion of "Changing Homeowner's Lawn Care Behavior to Reduce Nutrient Losses in New England's Urbanizing Watersheds" is a research program to evaluate new technologies that will improve N fertilizer recommendations for turfgrass, whereas another section of the research deals with lower-input grass species. The results will be of use to homeowners with lawns, and also to turf professionals such as golf course superintendents, grounds keepers, sod producers, sports turf managers, and municipal workers with responsibilities of maintaining parks and recreational areas.

What has been done

A 3-yr research project funded by USDA-CSREES entitled "Changing Homeowner's Lawn Care Behavior to Reduce Nutrient Losses in New England's Urbanizing Watersheds" is in its third year. This is a multi-state research/extension/grant grant involving five different institutions from New England. One of Connecticut's roles is to evaluate new soil tests for use in guiding N fertilization of turf. Additional funding was obtained from the Connecticut Department of Environmental Protection for an education project entitled "Nitrogen Fertilizer Reductions on Coastal Lawns Through Training and Education." Two presentations emphasizing the research data and implications were given to turfgrass industry groups. Two presentations were given at the 2009 National Water Conference. Three technical reports were placed in the UConn Turfgrass Science Research Report for 2008. Two manuscripts were published in a peer-reviewed scientific journal.

Results

The results from the research suggest that fertilization practices (rates, timing, formulations) for turfgrass can be refined to maintain turf quality while decreasing the threats to water quality by nutrient pollution. Presentation of the research to industry professionals has prompted some to change or considering changing their current fertilization practices. Research indicates that new technologies such as hand-held reflectance meters and existing soil nitrate tests have the potential to better guide turf fertilization rates. Use of these technologies will

result in a decreased threat of nutrient enrichment of water resources. A state-wide program has been initiated in partnership with the Residential Water Quality extension faculty and several Master Gardeners to develop demonstration sites and provide information on lawncare decisions that can affect water quality. The demonstration sites include alternative, low-maintenance grass species and white clover as a substitute for fertilizer. Adoption of recommendations will decrease the need for supplemental water on turf and lessen the potential of water pollution from fertilizers applied to turfgrasses in the urban and suburban landscape.

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
2009	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Greenhouse crop production relies on root substrates such as soilless potting mixes (SPM) that are deficient in nutrients. In conventional production, this issue is easily overcome by the use of soluble and controlled-release synthetic fertilizers. The National Organic Standard (NOS) prohibits the use of synthetic fertilizers for Certified Organic crop production. Organic producers must therefore rely on nutrient-rich organic materials, such as compost, together with a few mined inorganic materials that are acceptable under the NOS. Organic materials tend to be inconsistent in both nutrient content and rate of release. Therefore, it is a serious challenge to provide adequate nutrition for Certified Organic crops in greenhouse production.

What has been done
Manufacturers of Soilless potting mixes (SPM) generally incorporate a "starter charge" of nutrients to provide adequate nutrition for the first few weeks of plant growth for seeds germinated in or seedlings transplanted into the mix. Providing a starter charge that is acceptable under NOS requires using an organic fertilizer. However, only a few fertilizers are available for this purpose, and very little information is available regarding their use. This project is evaluating organic fertilizers as a starter charge, and developing nutrient management strategies that maximize plant growth. Three different organic fertilizers at three rates are being compared with a negative control (no fertilizer) and a standard inorganic fertilizer at three rates.

Results

Readily apparent differences have been observed. Some organic fertilizers are nearly as effective as the inorganic fertilizer. Some of the organic fertilizer treatments have resulted in phytotoxicity for direct-seeded tomatoes. Further work is needed before definitive recommendations can be made.

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

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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

Integrated Pest Management - Greenhouses

All growers said they would recommend the program to other growers. Insecticide use was calculated by comparing their current use with their use before participating in the program. All participants increased their adoption of IPM practices. For the 12 participating businesses, insecticide use decreased as 0.76 pounds of insecticide active ingredient was saved from application. In addition, crop losses were reduced, cultural practices were improved, and crop quality increased.

Whenever possible, growers selected more environmentally friendly products with shorter reentry levels, lessening worker exposure to pesticides. Examples of such environmentally friendly products included: Beauveria bassiana (insect killing fungus), azadirachtin (insect growth regulator derived from the neem tree), Bacillus thuringiensis, and a microbial insecticide. Contact materials, such as horticultural oils and insecticidal soaps were for both insects and diseases such as powdery mildew. Growers also used more reduced risk products (as defined by the EPA) such as acetamiprid, bifenazate, pymetrozine and spinosad. Biologically based fungicides such as Trichoderma harzianum, Bacillus subtilus and Streptomyces lydicus were used to improve root health and lessen use of traditional fungicides.

Use of Biological Control Agents

Two growers released predatory mites (Ambylseius cucumeris) against western flower thrips. One grower used entomopathogenic nematodes (Steinernema feltiae) for western flower thrips as a foliar application. One grower released predatory mites (Phytoseiulus .persimilis) against two-spotted spider mites. One grower released predatory mites (Hypoaspis miles) and Atheta (rove) beetles against fungus gnat

larvae in propagation houses.

As more selective insecticides and miticides were used, more natural enemies were observed including ladybird beetle larvae, hover fly larvae, predatory mites. Hunter flies (Coenosia attenuata) were also noted at a number of greenhouses in CT. These beneficial flies are originally from Europe and were most likely introduced on plant material. Hunter flies may prey on fungus gnats, shore flies, leaf miners and whiteflies. At one grower location, we observed Synacera pauperi (a parasitoid of fungus gnats) in their propagation houses.

Improved Cultural Practices

Growers were also encouraged to improve cultural practices to improve crop quality. One grower used ribbons of yellow sticky tape, "hopper tape" to mass trap out fungus gnats and shore flies in their propagation houses. The hopper tape was attached to the boom watering equipment. Increased nutritional monitoring (more routine soil tests with soil test recommendations provided by Dr. McAvoy) helped improve crop nutrition, increasing plant's resistance to disease, avoid plant stress, and improved crop quality.

Outcomes

Increased adoption (100%)of recommendd BMP's by targeted grower population.

50% of participating growers reduced their pesticide use. 25% applied no pesticides so there could be no reduction.

Integrated Pest Management - General/Long Term

The goal of integrated pest management (IPM) is to reduce the dependence of agricultural producers, homeowners and schools on pesticides while maintaining or improving productivity, crop quality and quality of life. Since its inception in 1980, the University of Connecticut IPM program has made great strides in developing and implementing more sustainable methods for pest control throughout Connecticut. Since 1984, IPM personnel at the University of Connecticut have held over 824 full-season, one-on-one training programs for individual growers and groundskeepers in Connecticut. This training has vastly reduced pesticide use in Connecticut, resulting in nearly 92 tons of pesticide active ingredient not being applied to Connecticut crops and landscapes. The University of Connecticut IPM training programs have substantially improved the economic viability of agriculture in Connecticut through both lowering pesticide costs and reducing pest damage to crops. To date, these training programs have saved Connecticut growers well over $2.7 million.

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Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

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
212	Pathogens and Nematodes Affecting Plants	10%		20%	
215	Biological Control of Pests Affecting Plants	10%		20%	
216	Integrated Pest Management Systems	80%		60%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	7.0	0.0	2.0	0.0
Actual	5.2	0.0	1.2	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**
87282	0	20164	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
87282	0	20164	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
342425	0	101170	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Basic and applied research, field trials, Extension workshops, demonstrations

2. Brief description of the target audience

Agricultural producers, consumers, agency personnel at federal, state and local level.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	3000	12000	0	0
Actual	2800	10000	0	0

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	1	1	
Actual	1	1	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Websites developed

Year	Target	Actual
2009	1	1

Output #2

Output Measure

- Presentations and short courses

Year	Target	Actual
2009	35	40

Output #3

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual

2009	30	31

Output #4

Output Measure

- Media contacts

Year	Target	Actual
2009	30	32

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2009	0	0

Output #6

Output Measure

- Conference abstracts

Year	Target	Actual
2009	0	0

Output #7

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2009	2	3

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
2009	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
2009	15	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In Connecticut, the greenhouse industry is a significant part of the agricultural industry with 280 wholesale commercial greenhouse growers producing greenhouse crops with a wholesale value of over $90 million dollars (NASS, May 2006). Greenhouse crops produced include bedding plants, specialty annuals, herbs, vegetable bedding plants, herbaceous perennials, garden mums, and pot crops such as poinsettias.
Customers have a very low tolerance for any evidence of insect pests or diseases while at the same time are increasingly interested in less pesticides, and more sustainable practices. Because of this, growers must produce very high quality, pest-free crops. In the enclosed greenhouse environment, pest populations can develop rapidly, so there is a need for timely up-to-date information to make pest management decisions. Pesticides in the greenhouse industry relate to worker safety, development of resistant insect and disease populations due to overuse of pesticides, adverse impacts on crop growth including phytotoxicity (plant damage), and pollution of ground and surface waters.

What has been done
The Extension sustainable greenhouse program targeted the 600 wholesale and retail greenhouse growers across Connecticut, consisting of intensive hands-on field training, and site visits, with diagnostics, nutrient and cultural management recommendations. Partners with University of Connecticut, Department of Plant Science, Soil Nutrient Analysis Laboratory, Connecticut Greenhouse Growers Association, Connecticut Agricultural Experiment Station, Connecticut Department of Environmental Protection, NORTHEAST SARE, University of Massachusetts and University of Rhode Island. Participants in the Sustainable Greenhouse IPM Program include businesses ranging in size from small 1300 square feet greenhouse operations to wholesale greenhouse businesses with 283,140 square feet of production. Participants included both spring seasonal businesses that grow bedding plants and garden mums as well as year-round producers of spring bedding plants, herbaceous perennials, garden mums and poinsettias. Growers learned to identify pests, nutritional and cultural problems, find sustainable solutions, learn how to use tools for early diagnosis, cultural practices to reduce pests and how to use low-risk pesticides and biological controls. Full season hands on training sessions were held at 12 businesses, impacting 13.0 acres (568,628 square feet) of intensive greenhouse production with an estimated crop value (assume sales of $12 per square foot) of approximately 6.8 million dollars. In addition, growers had approximately 8.2 acres of outdoor production of garden mums, herbaceous perennials and woody plants. Over 35 site visits to greenhouse businesses were also made throughout the state where growers received direct diagnostic advice and walk-in consultations. Over 95 IPM visits were made to growers participating in the Sustainable Greenhouse IPM program.

Results
Increased adoption (100%)of recommended BMP's by targeted grower population. 50% of participating growers reduced their pesticide use. 25% applied no pesticides so there could be no reduction. All participants increased their adoption of IPM practices. For the 12 participating businesses, insecticide use decreased as 0.76 pounds of insecticide active ingredient was saved from application. In addition, crop losses were reduced, cultural practices were improved, and crop quality increased. Whenever possible, growers selected more environmentally friendly products with shorter reentry levels, lessening worker exposure to pesticides. Examples of such environmentally friendly products included: Beauveria bassiana (insect killing fungus), azadirachtin (insect growth regulator derived from the neem tree), Bacillus thuringiensis, and a microbial insecticide. Contact materials, such as horticultural oils and insecticidal soaps were for both insects and diseases such as powdery mildew. Growers also

used more reduced risk products (as defined by the EPA) such as acetamiprid, bifenazate, pymetrozine and spinosad. Biologically based fungicides such as Trichoderma harzianum, Bacillus subtilus and Streptomyces lydicus were used to improve root health and lessen use of traditional fungicides.
Growers increased use of of Biological Control Agents such as
predatory mites (Ambylseius cucumeris) against western flower thrips and entomopathogenic nematodes (Steinernema feltiae) for western flower thrips as a foliar application. As more selective insecticides and miticides were used, more natural enemies were observed including ladybird beetle larvae, hover fly larvae, predatory mites. Hunter flies (Coenosia attenuata) were also noted at a number of greenhouses in CT. These beneficial flies are originally from Europe and were most likely introduced on plant material. Hunter flies may prey on fungus gnats, shore flies, leaf miners and whiteflies. At one grower location, we observed Synacera pauperi (a parasitoid of fungus gnats) in their propagation houses. Growers were also encouraged to improve cultural practices to improve crop quality. One grower used ribbons of yellow sticky tape, "hopper tape" to mass trap out fungus gnats and shore flies in their propagation houses. The hopper tape was attached to the boom watering equipment. Increased nutritional monitoring helped improve crop nutrition, increasing plant's resistance to disease, avoid plant stress, and improved crop quality.

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

Outcome #3

1. Outcome Measures

Pesticide use reduction (%) by participating growers

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	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
212	Pathogens and Nematodes Affecting Plants
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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	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
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

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

Greenhouse program:

All growers said they would recommend the program to other growers. Insecticide use was calculated by comparing their current use with their use before participating in the program. All participants increased their adoption of IPM practices. For the 12 participating businesses, insecticide use decreased as 0.76 pounds of insecticide active ingredient was saved from application. In addition, crop losses were reduced, cultural practices were improved, and crop quality increased.

Whenever possible, growers selected more environmentally friendly products with shorter reentry levels, lessening worker exposure to pesticides. Examples of such environmentally friendly products included: Beauveria bassiana (insect killing fungus), azadirachtin (insect growth regulator derived from the neem tree), Bacillus thuringiensis, and a microbial insecticide. Contact materials, such as horticultural oils and insecticidal soaps were for both insects and diseases such as powdery mildew. Growers also used more reduced risk products (as defined by the EPA) such as acetamiprid, bifenazate, pymetrozine and spinosad. Biologically based fungicides such as Trichoderma harzianum, Bacillus subtilus and Streptomyces lydicus were used to improve root health and lessen use of traditional fungicides.

Use of Biological Control Agents

Two growers released predatory mites (Ambylseius cucumeris) against western flower thrips. One grower used entomopathogenic nematodes (Steinernema feltiae) for western flower thrips as a foliar application. One grower released predatory mites (Phytoseiulus .persimilis) against two-spotted spider mites. One grower released predatory mites (Hypoaspis miles) and Atheta (rove) beetles against fungus gnat larvae in propagation houses.

As more selective insecticides and miticides were used, more natural enemies were observed including ladybird beetle larvae, hover fly larvae, predatory mites. Hunter flies (Coenosia attenuata) were also noted at a number of greenhouses in CT. These beneficial flies are originally from Europe and were most likely introduced on plant material. Hunter flies may prey on fungus gnats, shore flies, leaf miners and whiteflies. At one grower location, we observed Synacera pauperi (a parasitoid of fungus gnats) in their propagation houses.

Improved Cultural Practices

Growers were also encouraged to improve cultural practices to improve crop quality. One grower used ribbons of yellow sticky tape, "hopper tape" to mass trap out fungus gnats and shore flies in their

propagation houses. The hopper tape was attached to the boom watering equipment. Increased nutritional monitoring (more routine soil tests with soil test recommendations provided by Dr. McAvoy) helped improve crop nutrition, increasing plant's resistance to disease, avoid plant stress, and improved crop quality.

Outcomes

Increased adoption (100%)of recommendd BMP's by targeted grower population.

50% of participating growers reduced their pesticide use. 25% applied no pesticides so there could be no reduction.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

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	10%		10%	
111	Conservation and Efficient Use of Water	20%		20%	
112	Watershed Protection and Management	30%		30%	
132	Weather and Climate	10%		10%	
133	Pollution Prevention and Mitigation	20%		20%	
141	Air Resource Protection and Management	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	7.0	0.0
Actual	5.0	0.0	4.2	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**
72567	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
72567	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
452942	0	488138	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

BMPs were developed, and outreach efforts to the agricultural, residential and engineering/regulatory community conducted. Training activitiesfor volunteers and muncipal officials were conducted.. Publications, fact sheets, web sites were made available. Demonstration sites developed.

2. Brief description of the target audience

Target audiences included agricultural producers, public decision makers, including federal and state agencies, municipal planners, various NGOs (land trusts, environmental organizations, etc.), and the general public.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	1200	3500	0	0
Actual	3000	3800	0	0

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	1	4	
Actual	1	3	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2009	15	18

Output #2

Output Measure

- Training manuals and instructional CDs developed

Year	Target	Actual
2009	2	1

Output #3

Output Measure

- News releases/articles

Year	Target	Actual
2009	10	15

Output #4

Output Measure

- Websites developed

Year	Target	Actual
2009	1	1

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2009	0	0

Output #6

Output Measure

- Conference abstracts

Year	Target	Actual
2009	2	2

Output #7

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2009	4	65

Output #8

Output Measure

- Presentations and short courses

Year	Target	Actual
2009	50	49

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
2009	5	12

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
With the continued development of Connecticut, management of esidential water systems and landscapes is a concern. Excess nutrients pose a threat to many water bodies in New England, both coastal and inland. While nitrogen is considered the limiting nutrient in estuaries and phosphorus in fresh waters, residential runoff is considered a source of both. Major coastal watersheds show increasing concentrations of nitrogen attributed to various causes including wastewater treatment facilities effluent, lawn fertilizer residue, septic systems, atmospheric deposition and runoff, which are all related to population growth and its associated land development patterns. Lawns, in addition to contributing nutrients to waters are estimated to use between 50-90% of outdoor water during the summer months. Both water quality and water availability can be issues of concern.

What has been done
"Changing Homeowner's Lawn Care Behavior to Reduce Nutrient Losses in New England's Urbanizing Watersheds" has social science and environmental science components. Extension outreach utilizes the research outcomes to deliver appropriate messages to homeowners and other targeted audiences. Three specific PowerPoints presentations were created; 8 workshops were conducted, 6 exhibits staffed; 1 Demonstration Landscape designed and planted and 3 Demonstration Sites maintained and soil data collected.

Results
Of the program respondents completing the post program evaluation of turf programs: 69% water their lawn less frequently; 19% have reseeded with drought tolerant type of grass; 94% leave clippings on the lawn; 88% let the grass go dormant in summer drought; 0% have an irrigation system; 50% are using more native plants; 44% reduced the size of lawn
19% have added a buffer; 88% have increased use of mulch; 75% are composting; 9% had soil tested; 81% found the materials helpful.

East Lyme Programs - Water Conservation and Protection:
17 of 43 respondants:
100% have changed a landscape management practice to be more water protective as a result of the programs (returning clippings to the lawn, allowing the lawn to go dormant, using compost and mulch)
75% found the written materials useful

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 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Turfgrass represents one of the largest agricultural commodities in the Northeastern U.S., and the industry is growing rapidly in response to increasing urbanization of the region. Best management practices for turf need to be developed and implemented to minimize the threat of water pollution from turfgrass fertilizers. A portion of this research program is evaluating new technologies that will improve N fertilizer recommendations for turfgrass, whereas another section of the research deals with lower-input grass species. The results will be of use to homeowners with lawns, and also to turf professionals such as golf course superintendents, grounds keepers, sod producers, sports turf managers, and municipal workers with responsibilities of maintaining parks and recreational areas. Coordinated research and extension-outreach activities will decrease the need for supplemental water on turf and lessen the potential of water pollution from fertilizers applied to turfgrasses in the urban and suburban landscape.

What has been done
A 3-yr research project funded by USDA-CSREES entitled "Changing Homeowner's Lawn Care Behavior to Reduce Nutrient Losses in New England's Urbanizing Watersheds" is in its third year. This is a multi-state research/extension/grant grant involving five different institutions from New England. Connecticut's component of the project is to evaluate new soil tests for use in guiding N fertilization of turf. Additional funding was obtained from the Connecticut Department of Environmental Protection for an education project entitled "Nitrogen Fertilizer Reductions on Coastal Lawns Through Training and Education."

Outputs
Two presentations emphasizing the research data and implications were given to turfgrass industry groups.

Two presentations were given at the 2009 National Water Conference. Three technical reports were placed in the UConn Turfgrass Science Research Report for 2008. Two manuscripts were published in a peer-reviewed scientific journal.

Results
Research results to date suggest that fertilization practices (rates, timing, formulations) for turfgrass can be refined to maintain turf quality while decreasing the threats to water quality by nutrient pollution. Presentation of the research to industry professionals has prompted some to change or considering changing their current fertilization practices. Research indicates that new technologies such as hand-held reflectance meters and existing soil nitrate tests have the potential to better guide turf fertilization rates. Use of these technologies will result in a decreased threat of nutrient enrichment of water resources. A state-wide program has been initiated in partnership with the Residential Water Quality extension faculty and several Master Gardeners to develop demonstration sites and provide information on lawncare decisions that can affect water quality. The demonstration sites include alternative, low-maintenance grass species and white clover as a substitute for fertilizer.

4. Associated Knowledge Areas

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

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
2009	10	14

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. New regulations being written for Concentrated Animal Feeding Operations (CAFOs) would require farms to apply manure according to a strict phosphorus standard, to minimize the amount of P in runoff waters. This would mean that phosphorus levels in the soil would be used to determine the amount of

manure and fertilizer that could be applied to a crop. Connecticut farmland soils are high in phosphorus from decades of animal agriculture and application of generated manure.

What has been done
The NMP program conducted 22 individual grower meetings to share results of the analysis with cooperating farms to help farmers learn to manage manure environmentally as well as agronomically. A compost facility was built on one of the cooperating farms to facilitate movement of nutrients off the farm to reduce excess nutrient applications. This facility was underwrtitten with $1,000,000 in grant funds obtained from EPA/CT DEP as a direct result of the NMP documenting the nutrient excess and the need to move nutrients off of the farm. The majority of P comes in purchased feed rather than fertilizer. Farmers have decreased the amount of P in the rations, but cattle are only about 50% efficient at removing P from feedstuffs thus 50% of P in the diet passes through the animals and ends up in the manure applied to crop land. This leads to an imbalance on the farm and the accumulation of P in the soil. There is limited opportunity to move manure off the farm, particularly liquid dairy manure.

Results
Cooperating farms lowered manure application rates from a maximum of 49,000 gallons per acre in the baseline year to a maximum of 15,000 in crop year 2008. Average fertilizer application rates for nitrogen decreased from 62 pounds per acre in the baseline years to 35 pounds per acre(-43.5%) in 2008. Average fertilizer application rates for phosphorous from 7 pounds per acre in the baseline years to 3 pounds per acre(-57.1%) in 2008. Average fertilizer application rates for potassium decreased from 50 pounds per acre in the baseline years to 27 pounds per acre(-46.0%) in 2008. Compared to baseline data 14 farms saved a total of $302,812 on fertilizer by following their Nutrient Management Plans.

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
2009	15	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Environmental horticulture is a major sector of agriculture in Connecticut with 3350 firms in this industry in the state. Many firms are involved in more than one activity, such as production (nurseries, greenhouses, herbs, cut flowers or turfgrass), retail (garden centers and florists), or landscape services (landscape design, installation, maintenance, lawn care). The estimated value of this industry in CT is $1.022 billion. The environmental horticulture industry is also keeping over 46,000 acres in agriculture with 23% in open space and 3% in a land preservation program. (Perry and Stack, 2009). There is a need for up-to-date research based information for these companies to remain profitable and competitive as the public demands more sustainable products and services. Both novice and experienced gardeners need accurate, environmentally responsible gardening information. The director of the National Gardening Association recently stated "A majority of US households follow only two out of 12 of the recommended environmentally-friendly lawn and garden practices." (Anon, 2008)

What has been done
The Perennial Plant Conference - A Conference for the Professional Horticulturist was held March 2009 at the University of Connecticut. The all-day conference targeted members of the ornamental horticulture industry from the New England area, with 300 attending and 88 completed evaluation forms. In response to the need for accurate, environmentally responsible gardening information for home gardeners, a companion conference - the Home Gardener was also held March 2009 at the University of Connecticut, with over 335 attending and conference. 220 completed evaluation.

Results
As a result of the conference, the Professional horticulturists reported as follows: 84% stated that they would benefit economically; Of those responses, they will benefit economically by: increasing sales; better crop selection; and reaching new customers; 85% stated that they learned information that would help them become more sustainable by -reducing pesticide use, increasing confidence in biological alternatives, adopting more appropriate design practices,
selecting more appropriate plant material; 89% stated that they were more prepared to practice sustainable horticultural practices; 82% stated that they are more prepared to make changes to their business operation; awareness of recommended BMP approaches by defined targeted industry and growers (85%). As a result of the Gardening Conference, home gardeners reported that: 100% rated the Garden Conference as good to excellent;100% stated they would recommend this conference to others and 96% stated that they learned information at the conference to help them become more sustainable by making their gardens more productive, helping them select more appropriate plants, reducing the time spent maintaining their gardens, and saving money and 97% of the respondents felt more prepared to make changes to their home landscape and garden.

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)
- Before-After (before and after program)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

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	10%		20%	
302	Nutrient Utilization in Animals	20%		20%	
304	Animal Genome	10%		20%	
305	Animal Physiological Processes	10%		10%	
306	Environmental Stress in Animals	10%		10%	
307	Animal Management Systems	40%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	5.0	0.0
Actual	3.8	0.0	17.3	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**
0	0	50528	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	50528	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
532633	0	1407329	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research activities will include both applied and basic research primarily in the areas of biotechnology, nutrition and food safety

Extension activities include conferences, workshops and tours, as well as web pages, newsletters and partnerships with other organizations.

2. Brief description of the target audience

Policy makers, industry, producers, scientific community, agencies, regulators, youth.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	500	1200	100	200
Actual	600	1250	200	500

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

Year: 2009
Plan: 1
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	2	3	
Actual	2	3	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Books and monographs

Year	Target	Actual
2009	1	1

Output #2

Output Measure

- Conference abstracts

Year	Target	Actual
2009	1	2

Output #3

Output Measure

- Workshops and conferences hosted

Year	Target	Actual
2009	3	5

Output #4

Output Measure

- Fact sheets and bulletins

Year	Target	Actual
2009	10	12

Output #5

Output Measure

- Websites developed

Year	Target	Actual
2009	1	1

Output #6

Output Measure

- Presentations and short courses offered

Year	Target	Actual
2009	20	28

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 entitities 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
2009	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Animal cloning could be a boon for the biotechnology and agricultural industries if only more livestock survived. Basic research is essential to understand the factors involved.

What has been done
A sheep model is being used to determine dynamic in vivo changes in regulatory proteins in the corpus luteum (CL) during CL regression (luteolysis). In this model, infusions of PGF2a (20ug/min/1hr) are given systemically during the mid-luteal phase of the cycle at a frequency and duration that mimics the pattern of endogenous uterine PGF2a secretion. Hourly blood samples are collected to monitor progesterone (P) concentration, and luteal tissue is collected surgically at 0, 1, 8, 16, and 24hr following each pulse. Protein levels were determined for tissue inhibitors of metalloproteinases (TIMP) -1, -2, and -3, matrix metalloproteinase (MMP) -2 and -9, cyclooxygenases (COX) -1, COX-2 and steroidogenic acute regulatory protein (StAR) after a single pulse of PGF2a.

Results
Information from the above studies has provided insights into the process of corpus luteum regression and the establishment of pregnancy in sheep. By extension, these studies may lead to an increase in reproductive efficiency in sheep, an important food and fiber animal, as well as in other ruminants. The results of the protein analysis of corpora lutea collected after one, two, and three systemic pulses of PGF2a suggest a net increase in proteolysis within the CL after each pulse. Such a finding indicates that a decline in the integrity of the extra-cellular matrix (ECM) of the CL is likely to contribute to structural luteolysis Degenerative changes in the ECM would most likely disrupt the function of luteotropic membrane receptors and also inhibit the transport of cholesterol into steroid producing cells of the CL, thus contributing to the decline of P during functional luteolysis. The observed profound effect of prostaglandins on regulators of the extracellular matrix in the corpus luteum is relevant to other biological systems where prostaglandins and the extracellular matrix are known to be important, notably in the process of ovulation and menstruation and in certain forms of cancer.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
304	Animal Genome
305	Animal Physiological Processes

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
2009	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The health of the world's oceans is reflected in the health of animaals that inhabit it. With some populations in decline, it is important to understand the nutritional status and what stresses influences it in seals, whales. sea lions, etc.

What has been done
We have validated GH and IGF assays in free-ranging and rehabilitated harbor seals, captured (short-term) and captive (long-term) Steller sea lions, rehabilitated fur seals and captive (long-term) Beluga Whales. We are currently quantifying GH, IGF-I and IGFBP-2 and -3 in these species in an effort to develop a model that relates nutritional status and hormone concentrations that will enable us to identify nutritional stress in wild populations of seals and sea lions.

Results

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 entitities 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 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	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
305	Animal Physiological Processes
306	Environmental Stress in Animals
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
2009	15	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The viability of Connecticut farms is dependent on the farmer's evaluation of the profitability of each potential product the farm may consider marketing. The traditional farm dream is to grow plants and animals, without consideration of price or even market choice, with a net income to live a 'quality' life.

Focus:
The state Department of Agriculture's grant programs to farmers requires that a business plan is submitted with the application. The applicants were farms of all varieties, attempting to expand, diversify, or replace obsolete facilities. Many of the farmers had never looked at the budget for their enterprise, often struggling to continue the farm, often with the assistance of their spousal income.

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
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

2009	1	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
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

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

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
311	Animal Diseases	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	9.0	0.0
Actual	3.7	0.0	10.7	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**
7729	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
7729	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
483876	0	1229122	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research focused on molecular level work to identify disease mechanisms and prevention approaches, often in collaboration with other labs and institutions. Extension focused on diagnostic testing, workshops, individual consultations.

2. Brief description of the target audience

Scientists, regulatory and health agencies, land and water based producers and managers, consumers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	250	1200	0	0
Actual	300	1250	0	0

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	1	7	
Actual	1	20	21

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Workshops and conferences

Year	Target	Actual
2009	1	2

Output #2

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2009	5	7

Output #3

Output Measure

- Websites developed

Year	Target	Actual
2009	0	1

Output #4

Output Measure

- Animal cases examined

Year	Target	Actual
2009	1300	12000

Output #5

Output Measure

- Disease surveillance programs implemented

Year	Target	Actual
2009	2	2

Output #6

Output Measure

- Books and monographs

Year	Target	Actual
2009	0	0

Output #7

Output Measure

- Conference abstracts

Year	Target	Actual
2009	1	1

Output #8

Output Measure

- Presentations and short courses

Year	Target	Actual
2009	10	12

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.

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
2009	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The health of poultry and other birds are essential to the security of the food supply, public health and confidence and the economics of food production. Avian diseases can be spread rapidly, due to the nature of raising poultry flocks. More information about Mycoplasma gallisepticum, an avian pathogen which causes chronic respiratory disease in chickens, is needed.

What has been done
The project has investigated the means of attachment; cytadherence molecules and host cell receptors, as well as control mechanisms of variably expressed cell surface proteins involved in cytadherence and/or evasion of the host immune response. Previously, we completed the genome sequencing and annotation of the low passage virulent strain R of M. gallisepticum (Rlow). We are currently utilizing the genomic data to study gene expression and functional genomics. We are currently performing comparative genomic evaluations of the virulent Rlow genome to both, the avirulent M. gallisepticum Rhigh genome as well as the vaccine strain, F strain genome, both of which we recently sequenced. The comparative genomic analysis of these strains will shed light on the mechanism(s) of pathogenesis employed by this important agricultural pathogen. We have recently undertaken another project with an overall objective to sequence and compare the complete genomes of 8 M. gallisepticum house finch isolates from 1994 until the present and from different locations in the U.S. during the epizootic.

Results
Whole genome sequencing and comparative genomic analysis of historical and contemporary isolates of M. gallisepticum, both temporally and spatially, from house finches will reveal details about the molecular evolution of M. gallisepticum as a consequence of emergence and spread of this pathogen within a new host population. Also the Center of Excellence for Vaccine Research (CEVR)continues address the mechanisms of pathogenesis of, and the immune responses to, viral and bacterial pathogens with the goal of developing safe and effective vaccines. CEVR participates in consortium with The University of Missouri's Program for the Prevention of Animal Infectious Diseases (PPAID) and the USDA Plum Island Animal Disease Center. This creates tremendous strength in the areas of infectious diseases, microbiology, immunology and molecular biology. These collaborations have now set the necessary framework for the development of improved vaccines, therapeutics and diagnostic tests to control infectious diseases that threaten the United States food animal industry.

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 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	0	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Rapid detection of illness in the avian species is essential to the food supply, the public health and the economics of agriculture. Tracking different strains of viruses and other pathogens is essential in the global economy.

What has been done
Previously, we successfully developed a multiplex Polymerase Chain Reaction (PCR) for three viral pathogens of shrimp. The current effort was to design and apply a DNA bar-coding system for viral pathogen avian influenza sub-typing. Collaborative research with the Guangxi Veterinary Research Institute and support from the National Science Foundation supported the effort. This multiplex PCR will simultaneously detect and differentiate infections of these viral pathogens in infected shrimp.

Results
The project resulted in the development of software "PrimerHunter" and designing of the specific primers used in real time PCR assays for simultaneous differentiation of avian influenza subtypes. PrimerHunter designed PCR primers were selected and used in the validation experiments of three important avian influenza HA subtypes. Primers selected using PrimerHunter have high sensitivity and specificity for target sequences. The computer base software program is a tool for designing the specific DNA primers for detecting and differentiating of avian influenza subtypes viruses. This software has provided the primers for very important H5 ,H7 and H3 subtypes of avian influenza viruses, which were tested for its specificity and sensitivity in the laboratory using real-time PCR assays and found to be very useful.

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
2009	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Providing early warning for the appearance of the highly pathogenic strain Asian H5N1 avian influenza, which is a significant public health concern, is of critical importance to the public safety and well being. The Connecticut Veterinary Medical Diagnostic Laboratory, acting in collaboration and with fiscal support of the Connecticut Department of Agriculture, the CT Department of Environmental Protection, USDA APHIS Veterinary Services and USDA APHIS Wildlife Services, provides comprehensive surveillance testing for avian influenza in both wild and domestic birds throughout the New England region. This testing involves several different state and federal programs and utilizes various diagnostic testing modalities to achieve a comprehensive assessment of the avian influenza status of birds in New England.

What has been done
The Connecticut Veterinary Medical Diagnostic Laboratory carried out sample accession, testing, data analysis and reporting. The CT State Veterinarian and Departments of Agriculture throughout New England developed testing strategies and submitted samples from domestic birds for testing. USDA APHIS VS submitted live bird market samples for testing and provided workplans and funding. USDA APHIS Wildlife Services provided funding and collection strategies, and worked with New England state wildlife agencies to collect wild bird samples. A total of 12,423 samples from New England were tested for avian influenza. These included 4850 PCR (polymerase chain reaction) tests from wild birds, 2502 PCR pooled samples from domestic birds, 30 PCR samples from other birds, 6632 AGID (agar gel immunodiffusion) samples from sera of domestic birds, 108 AGID samples from eggs of domestic birds, and 301 virus isolation samples from live bird markets. Results of this testing was reported to the appropriate state and federal officials as required for the various programs involved.

Results
Connecticut Veterinary Medical Diagnostic Laboratory at the University of Connecticut has participated in several state and federal avian influenza surveillance programs, utilizing resources from these programs plus our own resources to provide comprehensive testing for avian influenza in New England. Based on 12,000 samples tested,we have been able to provide evidence that the Asian H5N1 strain of avian influenza is not present in the widely tested wild and domestic avian population of New England. This knowledge is important economically to the poultry industry as well as to public health officials.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

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 public is more aware of food safety issues related to the food supply, as well as diseases that may be transmitted from animals to humans.

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}