

# **Connecticut Annual Report of Accomplishments FY 2006**

Connecticut Cooperative Extension System  
Storrs Agricultural Experiment Station

This certifies that the University of Connecticut has submitted their Fiscal Year 2006 Annual Report of Accomplishments.

Submitted by:

A handwritten signature in black ink, appearing to read "Kirklyn M. Kerr". The signature is fluid and cursive, with the first name being the most prominent.

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***Goal 1 – An Agricultural System that is Highly Competitive in the Global Economy***

The Connecticut program was particularly active and successful in this area with a wide variety of plant and animal agricultural efforts conducted during the reporting period.

Animal research trials saw positive efficiency of a previously-developed recombinant DNA vaccine for Infectious Bronchitis virus, a highly contagious respiratory and urogenital disease of chickens.

Cloning highlights included major research work in the areas of reproductive physiology and animal biotechnology, particularly cloning and transgenic technology to improve animal reproductive efficiencies. Emphasis was placed on improving cloning techniques and understanding various mechanisms in nuclear-cytoplasmic interactions and genetic reprogramming during nuclear transfer. This work received considerable national and international financial support and media coverage.

Public understanding of milk pricing problems were enhanced through the application of exhaustive investigations of retail milk pricing in the region, resulting in extensive and intensive interactions on various public policy fronts, especially at the State legislature.

Surveillance programs to monitor poultry and other birds' diseases resulted in control of ILT and infectious bronchitis. 3.8 million birds were protected from IBVD spread. Extension efforts to deal with poultry pests through reduced fly and pest populations were found to be effective, with cost savings realized by many producers.

An internet-based plant database resulted in thousands of contacts and use of information for landscape design by professional and residents alike.

Benefits to clientele and stakeholders who participated in this goal area were many; including the development of new vaccines for testing, economic evaluation of the milk pricing system, and world-leading plant and animal cloning efforts.

In summary, the assessment of accomplishments is considerable, and is measurable in terms of the previously submitted 5-year Plan of Work. Total expenditures, by source of funding, and full-time equivalents for this goal are:

Goal 1		
Funding Source	Expenditures	FTEs
Smith-Lever	394,358	7.86
Hatch	43,600	0.96
Multi-state research	78,530	1.14
State funds	7,709,737	114.14
Competitive grants	750,148	15.77
Animal Health	-	-
Total	8,976,373	139.87

**Key theme – Production of Transgenic Swine for Xeno-transplantation.**

a. Activity – Currently there are not enough organs and tissue available for the number of patients needing them. Also when tissue from two divergent species is mixed the host usually destroys the donor tissue. Therefore there is a place and a need for tissue from a species such as swine to be engineered to allow transplantation into humans. The focus of this project is to produce swine that possess and express human genes that will help allow swine tissue to be transplanted into humans. The objective of this particular project was to produce transgenic swine by breeding swine that are known to possess human genes (H-transferase and human complement inhibitor CD 59). Ten swine have been produced that possess at least one of the three constructs. Several manuscripts have been published pertaining to these projects.

b. Impact –The outcomes of this project could lead the way into treatment of Parkinson's disease and regeneration of injured nerve tissue. This research has put UConn swine work at the top of swine transgenic work going on in the world.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Prevalence of Non-glandular Gastric Ulcers in Horses Involved in a University Riding Program**

a. Activity – Previous studies have found gastric ulcers to be a significant problem in horses engaged in strenuous exercise or training such as racing Thoroughbreds, competition, endurance, and show horses. In these studies, prevalence of gastric ulcers was found to range from 37-93%. Another study suggested that frequent traveling over long distances, frequent work, and the many environmental and dietary changes related to showing may have a negative influence on the ability of the gastric mucosa to withstand damage. The objective of the study was to determine the prevalence of gastric ulcers in horses involved in a university riding program. 11% (9) of the horses had non-glandular ulcerations. Age and gender were found to have a significant effect on ulcers in this population. Horses that were 2 to 6 or 18 to 23 years of age and mares were most affected by gastric ulcers. Ulcer occurrence was lower in this population than in any previous studies focused on elite, heavy use performance horses, show horses, racehorses, and recreational horses.

b. Impact – This study challenges previously held assumptions that gastric ulcers are found at a high level in recreational riding horses and may lead to further studies of recreational riding or "backyard" horses that do not travel frequently to see if they also have an increased incidence of gastric ulceration. Horses utilized predominantly in their home environment may suffer from a lower occurrence of gastric ulcers than previously studied populations such as racing and show horses despite the frequency and intensity of their activities. Outputs were a peer-reviewed journal article "Prevalence of gastric ulcers in horses involved in a university riding program" published in the May 2006 Journal of Equine Veterinary Science and oral presentations at two scientific meetings, the annual Animal Science meeting and the Equine Science Society meeting.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Stem Cell Legislation in Connecticut**

a. Activity – Proposed legislation to allow stem cell research resulted in testimony to the Connecticut Legislature’s Public Health Committee regarding legislation entitled “An act permitting stem cell research and banning human cloning.” Additional activity involved serving as a panelist on a stem cell summit at the invitation of the Connecticut Secretary of State, and fielding numerous questions from the public regarding stem cell research. Extensive interviews were given to the press with considerable quotes in the Hartford Courant, and other print, radio, and TV reports. The most significant of these is a two page report featuring laboratory work at UConn in the Hartford Courant.

b. Impact – Enhanced education of legislators and public on stem cell research issues.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Animal Cloning and Biotechnology**

a. Activity – Research areas included the areas of reproductive physiology and animal biotechnology, particularly somatic nuclear transfer cloning, embryonic stem cells, sexing, and transgenic technology with a goal to improve animal reproductive efficiencies by developing and optimizing various reproductive biotechnologies. Particular focus has been on improving cloning techniques and the understanding of various mechanisms in nuclear-cytoplasmic interactions and genetic reprogramming after somatic nuclear transfer.

b. Impact – Over the last 10 years, over \$10 million in extramural support has been received from USDA, NIH, the State of Connecticut (CII), the Rockefeller Foundation, and the pharmaceutical industry, such as Genzyme, Evergen Biotechnologies, Inc., and Biotechnology Research and Development Corporation (BRDC). Success in cloning research has resulted in a University of Connecticut investment of over \$10 million to establish a state-of-the-art Center for Regenerative. Over 100 peer-reviewed papers have been published including four high-profile Nature/ Nature Biotechnology/PNAS papers. Research success has been widely reported around the globe including The CNN Headline News, CBS, ABC, NBC, BBC News, NPR News, USA Today, The New York Times, The Washington Post, The Wall Street Journal, The Chicago Tribune, The Boston Globe, London Times, Associated Press, Reuters, Agency France Press, China Press and Xinhua News Press.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Ontogeny of Somatotrophic Axis in Beef Cattle**

a. Activity – Research focused on identifying changes in several components of the somatotrophic axis, including growth hormone (GH), insulin-like growth factor (IGF) I, and the IGF binding proteins (BP), in growing beef cattle from birth to one year of age. This work couples with previous work on using exogenous somatotropin to stimulate growth rate in growing beef cattle. The goal is to more clearly define changes in the somatotrophic axis with age to utilize exogenous somatotropin more efficiently. Results have shown that exogenous somatotropin can increase growth rate 7 to 15% in growing cattle depending on the age, body weight and nutritional plane of the animals.

b. Impact –By more clearly identifying age-related changes in the axis, a reduction in the variation in response to exogenous somatotropin can occur, thereby increasing the potential for economic success of beef producers that may utilize somatotropin in the future.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Non-mammalian Zoo and Aquarium Pathology**

a. Activity –The objective of this non-mammalian, zoo, and aquarium pathology service is to provide expert diagnostic pathology services to aquariums and utilize the case material as a source for active and didactic teaching and knowledge transfer within the context of a program of instruction in anatomic and molecular microbiology. The major research initiative has been molecular identification and phylogenetic determination of chlamydia-like bacteria responsible for gill disease in farmed salmonids. Previous work on the genome sequencing and annotation of the low passage virulent strain R of *M. gallisepticum* was completed which enabled use of the genomic data to study gene expression and functional genomics. The comparative genomic analysis of these strains will shed light on the mechanism(s) of pathogenesis employed by this important agricultural pathogen.

b. Impact – A rapid and versatile molecular diagnostic system for the detection of *Mycoplasma mycoides* subspecies *mycoides* Small Colony (*M. mycoides* SC) using TaqMan probes for the real-time monitoring of PCR amplification of genetic targets was developed. This work creates tremendous strength in the areas of infectious diseases, microbiology, immunology and molecular biology as 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.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Comparative Genomics of Vaccine Strains of *Mycoplasma gallisepticum***

a. Activity – *Mycoplasma gallisepticum* is an avian pathogen involved in chronic respiratory diseases in chickens and infectious sinusitis in turkeys, resulting in considerable economic losses in poultry production. Research was based on the hypothesis that the reduced virulence of

vaccine strains of *M. gallisepticum* can be accounted for by genomic and transcriptional differences in genes involved in virulence. DNA microarray technology was being used to identify genetic differences in *Mycoplasma gallisepticum* vaccine strains.

b. Impact –Comparative genetic analysis of virulent and vaccine strains of *M. gallisepticum* will help identify candidate virulence-related genes, thereby contributing to a fuller understanding of the pathogenesis of *M. gallisepticum*.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

### **Key theme – Infectious Bronchitis Virus**

a. Activity – Infectious bronchitis is an acute, highly contagious respiratory and urogenital disease of chickens. The highly transmissible nature of the disease suggests that use of a vaccine is necessary to prevent outbreaks. Both live attenuated and inactivated vaccines have been used in the vaccination process and have greatly reduced the economic losses caused by IBV infections. Induction and activation of the interferon system represents the first line of defense against viral diseases and possibly other infectious agents. Released interferon circulates in the body, activating immune responses through direct binding to the surrounding cells, and indirectly by influencing the release of a myriad of chemokines and cytokines. It stimulates innate responses as well as acquired responses. It activates the cells' interferon systems and puts them in an antiviral state. The research effort used interferon as an enhancer. Recombinant DNA vaccines for Infectious Bronchitis virus were developed, with trials indicating higher efficiency of the vaccine against infectious bronchitis virus infection in chickens using recombinant DNA vaccine coupled with interferon as an enhancer.

b. Impact – The development of a recombinant vaccine that contains the S gene and its use in-ovo with interferon alfa will be more practical for protecting chicks before hatching.

c. Source of Federal Funds – Hatch

d. Scope of Impact - Multi-state

### **Key theme – Disease Surveillance Program**

a. Activity – An ongoing Avian Influenza surveillance program was performed on Connecticut and New England poultry flocks. Surveillance of regulatory diseases was reported to the Connecticut Departments of Public Health and Agriculture, and USDA APHIS. A *Salmonella enteritidis* (SE) reduction program provided information on how to control SE contamination by thorough cleaning, biosecurity, pest management and possible SE vaccination programs. A poultry, game and pet bird disease diagnosis, prevention, treatment and control program was carried out along with a program targeted at food-borne pathogen contamination of poultry eggs and products. Postmortem, histopathological and bacteriological examinations of poultry and pet birds were conducted. Poultry farms were visited to discuss health and poultry management with poultry producers to prevent further losses due to diseases.

b. Impact –Total egg laying commercial flocks of 3.8 million were protected from the spread of Avian influenza, Infectious Bursal Viral Disease, Coryza, Colibacillosis and Pasteurellosis. All poultry, including backyard poultry and gamebirds flocks, were negative for Avian influenza virus. No outbreaks of Salmonella food-borne outbreaks related to eggs and egg products from Connecticut commercial egg farms were detected.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Immunotoxicology of PCBs**

a. Activity – PCBs are ubiquitous environmental contaminants. While their effects have been relatively well documented in laboratory animals, their effects in humans are assumed to be somewhat similar, with a few accidental exposures (to PCBs and other contaminating chemicals) resulting in compatible health effects. While the mechanisms and pathways involved in the effects of dioxin and dioxin-like PCBs are relatively well understood, the effects of the non dioxin-like PCBs (which are the most abundant in the environment) are relatively undocumented and have until very recently been for the most part ignored. Research was conducted to understand the effects of PCBs, and at comparing the immunotoxicity of PCBs between species. A system was developed to experimentally expose cells of the immune system to PCBs in vitro. This approach allowed the study of cells from different species of marine mammals as well as humans, for which in vivo exposure would raise significant ethical constraints.

b. Impact – Research results demonstrated the toxicity of non dioxin-like PCBs in humans and marine mammals. These studies demonstrated the importance of testing in the species of interest, as the effects would never have been discovered had tests not been performed in humans and marine mammals.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Swine Fever Virus and Porcine Respiratory and Reproductive Syndrome Virus**

a. Activity – Classical Swine Fever Virus (CSFV) is the causative agent of Classical Swine Fever (CSF) a highly contagious and significant pathogen of swine. Although the disease is not present in the United States, it is considered a threat for the swine industry. Research was conducted in collaboration with Plum Island Animal Disease Center to study CSFV's mechanism of virulence. The CSFV E1 glycoprotein was identified as a major determinant of virulence in swine. Porcine Respiratory and Reproductive Syndrome Virus (PRRSV) is considered the most economically significant endemic infectious disease problem facing the U.S. swine industry today. Research, in collaboration with the Plum Island Animal Disease Center, was designed to define the role of CSFV 3' untranslated region and glycosylation of virus surface proteins in infectivity in swine.

b. Impact –Collaboration on CSFV with an internationally recognized research center helps establish countermeasures to control and eradicate a CSFV outbreak should it occur in the United

States. Additionally, an early detection system for exotic or emerging diseases in Connecticut/New England/USA may result.

c. Source of Federal Funds – Hatch

d. Scope of Impact - Multi-state

**Key theme – Crohn’s Disease**

a. Activity – Research continues to try to identify the cause of Crohn’s disease (CD) of man, a chronic disease of the small intestine that appears to have no counterpart in our animal species. The pathologic lesion has some similarities to intestinal tuberculosis, Yersinia infection, and chronic salmonellosis. Therefore, there is the suggestion that an infectious agent may be responsible. Research results make a number of associations, perhaps the most important of which is the evidence of increased exposure, in the aggregate, to agents transmitted by the fecal-oral route in individuals who later developed CD.

b. Impact –If the findings are substantiated by other studies, it may be possible to make recommendations that would reduce the risk of CD in those families that are genetically susceptible, as well as in spouses.

c. Source of Federal Funds – Hatch

d. Scope of Impact - Multi-state

**Key theme – Transfer Technology to Dairy Producers**

a. Activity – A collaborative project with Tufts University Cummings School of Veterinary Medicine (TCSVM) was implemented to transfer technology to dairy producers interested in enhancing their conservation practices and adoption of novel production methods to improve economic viability. TCSVM has been piloting novel pasture-based livestock production methods intended to produce premium livestock products for regional production and consumption. One such product, veal calves raised on nurse cows, has shown great promise in the marketplace.

b. Impact –75 dairy industry personnel learned that it is feasible for a dairy farm to produce healthy, viable veal calves raised in an unconventional system that promotes conservation. Areas of management were identified that may be a challenge for dairy farmers along with recommendations to overcome the challenges. Based on a price of \$500 for a 350 pound calf, the profit per calf is estimated to be \$244 by following this practice.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Youth Poultry Projects and Non-Commercial Poultry Rearing**

a. Activity – During the past few years, more youth and families are rearing poultry for non-commercial use in New England, including chickens, ducks, turkeys, geese, gamebirds and other fancy fowl. In the spring of 2006 an average of 8,530 baby chicks (meat type, layer type and

fancy fowl) were being purchased or shipped each week to small flock owners throughout the New England states. Small flock owners are generally less experienced in the management of poultry and are more likely to mismanage the birds under their care, relative to proper nutrition, health care, humane treatment, breeding, transporting, and other management issues. A new health regulation requiring the testing of all birds going to shows, within as well as outside of CT, for Pullorum as well as Avian Influenza has helped to increase awareness of the threat of AI, especially since the outbreak of AI in Southeast Asia and other parts of the world. Small flock owners were educated about AI and its effects by working with 4-H Educators throughout Connecticut and New England, FFA, Farm Bureau, Connecticut Poultry Association, and the Connecticut Department of Agriculture. Poultry flock web sites <http://web.uconn.edu/poultry/4-hpoultry> and <http://web.uconn.edu/poultry/poulttypages> were updated and served to support educational programs that reached 600 adults and youth.

b. Impact – A large number of youth participated in the 11<sup>th</sup> Annual Southern New England 4-H Poultry Show and Showmanship contest. Many small flock and game bird owners also attended a workshop on AI. As a result of Youth and Non-Commercial Poultry Programs, there has been steady interest in poultry rearing. An estimate is a 1.5 - 3.5% increase during the past two years. There was also a slight increase in adults involved with poultry projects since last year. The economic impact on CT and New England is considerable. Small flock owners purchase 50 to 100 lb bags of feed at \$10 to \$20+ per bag. This is equivalent to \$400 per ton of feed, which in bulk sells for about \$160 to \$180 per ton. At a cost of about 20¢/lb (about 2x the cost of bulk feed) for an estimated 10,000 birds eating 100 lbs/year this is about \$200,000 generated sales annually in New England.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - New England

### **Key theme – Incubation and Embryology Teacher Education**

a. Activity – Biological sciences education in elementary and secondary schools is being limited by the types of living creatures allowed for study in the classroom. Chick embryos are still one of the species allowed for live study, along with some amphibians and invertebrates. The educational program focused on teachers to stimulate interest in the provision of information and materials related to chick incubation and embryology projects they can perform within their classrooms. In-Vitro observation of the chick embryo is one of the program highlights. The program has been adapted to several grade levels/age groups to increase student interest in biological/animal science early in their educational experience. Volunteer teachers and extension educators help organize workshops and the teachers oversee and teach the projects in their schools. Fertile eggs and incubators were made available to the teachers. A web site from UConn (<http://web.uconn.edu/poultry/4-hpoultry>) is available for teachers and students. Three teacher workshops, three hours in duration, were held in the New England region during the time period including two in MA and one live video conference to four sites in VT. More than 30 teachers representing grades 1 through 6 attended the workshops and 23 of these were new to the project.

b. Impact – This was the first year doing programming of this type in Vermont. In the past several years, teacher/volunteer workshops on Incubation and Embryology have been held in CT, MA, NH and VT. Results suggest that students exposed to incubation and embryology programs early in their educational experience are more open to rearing poultry as a 4-H/Youth project and as an adult. Teachers have average enrollments of 20 students in their classrooms, which translates to about 460 new students impacted. Overall, there are several thousand students experiencing this project each year in New England.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - New England

**Key theme –Agriculture Viability**

a. Activity –Small scale farm operations have an increasing need to learn entrepreneurial rather than commodity-based production skills. Through engagement with a regionally-based network of educators, farmer-to-farmer discussions were conducted during local farm tours of established ‘value-added’ livestock enterprises for 121 participants (poultry processing; vineyards/ wineries; rotational grazing; grass-fed beef and goats; gourmet lamb dish production; on-farm meat processing/ meat store; maple sugar harvesting/ syrup production; goat cheese processing). 61 agricultural businesses were advised on business management decisions.

b. Impact – Survey results (22% response) indicated that 75% learned new information about aspects of grass forage production, pasture management, grass identification and livestock production (including beef and sheep nutrition), slaughter regulations, and on-farm marketing. 80% changed behaviors involving pasture rotation and seeding of legumes to improve pasture quality, delayed time of breeding flock of sheep until late fall to delay lambing until April, feeding program to improve animal nutrition and improved pasture quality for sheep.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - Multi-state

**Key theme – Crop Insurance Education for Connecticut Agriculture**

a. Activity – Crop Insurance and Risk Management Education for Connecticut Agricultural Producers is needed to improve the economic viability and profitability of Connecticut agricultural enterprises. A series of crop insurance and risk management education sessions were developed and delivered for Connecticut producers and their advisors. Programs consisted of three half-day workshops for producers, and eight presentations at commodity group and producers’ organization meetings on crop insurance and risk management. Five all day one-on-one sessions were held where producers were given the opportunity to visit individually with advisors on how to work with local officials, estate planning, organic production, business planning, and crop insurance. The Connecticut Farm Risk Management and Crop Insurance website (<http://www.canr.uconn.edu/ces/frm/>) and periodic mailings kept Connecticut producers and agribusiness professionals up-to-date on the latest information on crop insurance and risk management topics.

b. Impact – Connecticut agricultural producers increased their viability and improved profitability through risk management education. USDA, RMA and CT crop insurance agents indicate significantly increased participation in crop insurance programs by Connecticut producers as a result of these programs. The Farm Risk Management team's work in crop insurance and farm risk management education from 2001 to 2006 has resulted in development of a broad based farm risk management Extension education program in the College of Agriculture and Natural Resources, helping to create a partnership with the State's agricultural community that includes advising and participation in farm risk management programs. New developments include partnering with: Northeast Transfer the Farm Project coordinated by University of Vermont Extension, an agricultural marketing workshop series co-sponsored by the UConn Farm Risk Management team, Connecticut Farm Bureau Association and Connecticut Department of Agriculture, and participation in planning the Northeast Farm Transfer Service Providers Network.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Fluid Milk Marketing and the Impact of the Northeast Dairy Compact**

a. Activity – From 1997 to 2001 the Northeast Dairy Compact was a special raw milk pricing program for the New England States. It was passed by the United States Congress and gave a regional commission the ability to set a minimum pay price for fluid milk in the New England region. The Dairy Compact was very controversial; however, it was effective in raising farm incomes for farmers that sold milk into the New England fluid milk market. The Dairy Compact was opposed by retailers and fluid milk processors not only in New England but throughout the United States because they saw this as the first step in reform of the nation's fluid milk marketing policies. Ultimately, the Northeast Dairy Compact was not renewed because of opposition from retailers, processors, and also farmers in other parts of the country who felt that they would not be able to establish such a program. Research evaluated the economic impact of the Northeast Compact upon retail prices in New England markets. More generally the project evaluated the impact of market power at the processing and retailer stages upon fluid milk prices in the New England markets before, during, and after the Northeast Dairy Compact.

b. Impact – Findings indicated that retailer market power is substantial in those markets and contributes to elevated retail milk prices. Recently, the State of Connecticut revived its Milk Regulation Board, with this research serving as the basis for the development of new state and regional fluid milk pricing policies. Future state and regional milk regulatory policies in the Northeast must consider the market power of processors and retailers if they are to advance the economic welfare of farmers and consumers and improve the economic efficiency of the fluid milk marketing channel.

c. Source of Federal Funds – Hatch

d. Scope of Impact - Multi-state

**Key theme –Plant Biotechnology**

a. Activity – A fairly well informed understanding of molecular genetics in terms of cloning and manipulating DNA can and should be within the grasp of the high school student. Further, molecular genetics as an outreach/educational endeavor has the ability to inform and educate scientists, the public, and stakeholders alike, in the area of how humans affect the biological world and how the biological world (i.e. environment) affects humans. An objective of the outreach program is to bring an understanding of molecular genetics and biotechnology to the high school student and teacher. The focus of the effort is to develop programs aimed at improving the ability of high school biology teachers to provide experiential learning exercises to students in the area of molecular genetics and biotechnology. Included was an *Educate the Educators program*, an intensive (full day programs) two-week molecular biology training program for UConn Neag School of Education senior students who are in the Teacher Education Program and intend to be high school biology instructors after their graduation.

b. Impact – Neag School of Education students who participated in the summer molecular genetics training program went out into secondary schools throughout the State of Connecticut this past academic year. Several reported back that the training and teaching tools they obtained from the program were helpful in their presentations to biology students.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Risk Analysis and Regulation of Genetically Modified Crops in Australia and the U.S.**

a. Activity – The United States grows 63% of the world's total acreage of genetically modified (GM) crops. While relatively few countries grow GM crops, every country must develop a regulatory framework to support activities such as food import, grain export, biotechnology investments and compliance with international treaties. Research has focused on comparing the regulatory and risk assessment frameworks for GM crops in Australia and the U.S. Comparative analysis of Australia and the U.S. has revealed similarities in the national commitment to biotechnology sciences, but has also shown that the Australian government has a higher degree of transparency, risk analysis and public dialogue.

b. Impact –Comparative analysis of biotechnology regulation and risk analysis provides new information to government officials, stakeholders, academics and others interested in the decision-making process.

C .Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Microbial Inoculants for Soilless Potting Mixes**

a. Activity –Soilborne pathogens can cause major crop losses for the greenhouse industry, which is high value component of agriculture in Connecticut. Growers routinely apply preventative chemical fungicides to avoid losses. Microbial inoculants (MI) that supply beneficial microbes are marketed to suppress soilborne pathogens and reduce the incidence of plant disease.

Growers are reluctant to rely on MI for two main reasons: first, they must be applied prior to any incidence of disease, and second, it is not possible to observe if the microbes persist in the potting mix or colonize roots. Research was conducted to evaluate the persistence and proliferation of MI in potting mixes and on plant roots; develop molecular methods for identification of MI; and determine the effectiveness of MI in suppressing plant pathogens in different potting mixes.

b. Impact – Results showed that the ability of MI to suppress disease is limited with a need for more definitive methods for identifying microbes when indigenous species of the same genus are present in the potting mix. Results indicate that positive identification of MI extracted from SPM and cultured on selective media can be obtained with PCR-based molecular methods. The horticultural science and plant pathology communities, as well as producers of microbial inoculants, have been provided with information regarding the efficacy of biological control of soilborne diseases in soilless potting mixes.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – UConn Turfgrass Disease Diagnostic Center**

a. Activity -Disease-related issues within commercial turfgrass systems (e.g., golf courses) are a major concern for turfgrass managers throughout Connecticut and New England. The pathogens that affect turf are very diverse and several are capable of rapidly killing large swards in a relatively short period of time. The large diversity of pathogens within turf also means that different control measures are necessary to manage each. The goal of the UConn Turfgrass Disease Diagnostic Center is to provide assistance in the form of rapid and accurate diagnoses of turfgrass maladies. A total of 550 telephone calls, conversations or emails were processed. Diagnostic services were rendered for 175 samples and an additional 50 on-site visits with golf course superintendents throughout the state and region were made. The UConn Turfgrass Disease Diagnostic Center has assisted commercial turfgrass managers from Connecticut, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island and Vermont.

b. Impact –The reputation of rapid and accurate diagnostic services at the University of Connecticut has led to the designation of the Center as an official turfgrass diagnostic lab for Syngenta Crop Protection. The UConn Turfgrass Disease Diagnostic Center's rapid response results in the proper selection and use of pesticides for disease control, thereby reducing the overall use of pesticides in the state.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - Multi-state

**Key theme – Developing a Fairway Topdressing Program**

a. Activity – Fairway topdressing surfaced approximately 20 years ago in the Pacific Northwest in an effort to improve playing conditions on waterlogged fairways. Many golf course superintendents across the country that have adopted this practice have reported several

agronomic and player benefits. A major agronomic benefit has been improved drainage, which has lead to less disease and firmer fairways. The benefits to fairway topdressing seem unanimous, but the practice requires a significant budget, considerable labor, time, and commitment to implement properly. Research was conducted to quantify the effects of particle size distribution and topdressing layer depth on infiltration rates and water retention by depth following several simulated precipitation events; determine whether particle size distribution and/or topdressing layer depth will help regulate root zone temperatures during periods of high temperature stress; and use the resultant data to make recommendations to improve the practice of fairway topdressing.

b. Impact – This research is currently in its initial stages, but results will likely have national implications by providing valuable information to golf course superintendents across the country currently practicing or contemplating a fairway topdressing program.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme –Sod Establishment Timing on Rooting Strength and Surface Quality**

a. Activity – During athletic field construction or renovation projects, securing adequate time for proper turfgrass establishment prior to field use is a significant challenge. The key to sod establishment and a high quality playing surface is proper root development. Construction and renovation projects often get delayed thereby diminishing the necessary time for sufficient root development. Research was undertaken to quantify the effects of sod establishment timing on rooting strength and determine the effect of sod establishment timing on playing surface quality.

b. Impact – This research is currently in its initial stages, but it is expected that results will enable athletic field managers to select the most appropriate time to establish sod to optimize playing surface traffic tolerance and safety.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme –Alternative Control Measures for Dollar Spot**

a. Activity – Dollar spot (*Sclerotinia homoeocarpa*) is arguably the most destructive turfgrass disease throughout the United States. The pathogen attacks all turfgrass species and more time and money is spent managing dollar spot than any other turfgrass disease. Despite the importance of *S. homoeocarpa*, many basic biological aspects of the pathogen remain unknown and management strategies often revolve around the use of fungicides. A focused effort to improve understanding of this pathogen and to provide new and/or improved management strategies was initiated.

b. Impact – Preliminary data indicated that fungicide efficacy could be drastically improved through the proper selection of application technology and may result in improved disease control and reduced pesticide use.

- c. Source of Federal Funds – Hatch
- d. Scope of Impact - State

**Key theme – Biological and Physical Constraints on Seed Development in Microgravity**

a. Activity – Plants are envisioned to play a central role in future long duration space exploration initiatives by providing food while simultaneously cleansing water and the breathable atmosphere through their functions in a Biological Life Support System (BLSS). However, growth of plants in microgravity had been problematic, especially with regard to seed production. The research objective has been to understand the challenges to seed production posed by spaceflight, and overcome them, while simultaneously learning how factors prevailing in the seed microenvironment constrain seed development on Earth. On February 1, 2006 a live distance learning presentation (broadcast from UConn) was delivered entitled “Seeds in Space” for 60+ students. The presentation was also videotaped for re-use with other groups.

b. Impact – Solving seed production problems in microgravity clears the way for the use of plants for food and life support on future long-duration space exploration initiatives. Understanding the basic physical and biological components of this problem not only assists in enabling the nation’s space exploration agenda, but also increases our basic knowledge of environmental control of seed development. By elucidating the role of these endogenous gases, especially oxygen and ethylene, agriculture and industry will have basic information they need to devise strategies to mitigate these losses.

- c. Source of Federal Funds – Hatch

- d. Scope of Impact - State

**Key theme –Northeastern Plant Disease Diagnostic Network**

a. Activity – The National Plant Diagnostic Network was established by the Secretary of Agriculture to the Cooperative State Research, Education, and Extension Service (CSREES) to develop a network linking plant and animal disease diagnostic facilities across the country. The University of Connecticut is a member of the regional Network in the Northeastern United States. In addition to general diagnostic assistance, a major responsibility of the Diagnostic Network is to serve as a first detector for potentially high risk pathogens and pests. Following the mission of the USDA grant, over 200 Master Gardeners have been trained as first detectors of exotic and invasive pathogens.

b. Impact – Establishment of the Home & Garden Education Center Diagnostic Laboratory within the Northeast Disease Diagnostic Network reduced the risk of serious economic losses due to the introduction of exotic pests in the Connecticut landscape. The diagnostic laboratory has improved the Home and Garden Education Center’s ability to diagnose and digitally document pest incidences. Additionally, results and recommendations provided during the diagnostic process ensures the proper selection and implementation of cultural, chemical and biological management practices for maximizing control with the least impact on the environment.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Internet Access to Landscape Plant Information**

a. Activity – The nursery industry is the most significant component of Connecticut’s agriculture. A recent survey of the New England ornamental plant industries determined that ornamental horticulture in Connecticut was valued at \$855 million, with 1,549 businesses that employ over 25,000 workers. Nursery and landscape businesses have recognized the need to seek out employees with a good working knowledge of the vast array of landscape plant species used in the Northeast. A labor force that is knowledgeable in landscape plant material identification and use is essential for the continued success of Connecticut’s nursery and landscape industry. Computer technology has been identified as one way that information can be made available to a large audience at all times when personnel are limited. The public is adopting the Internet and the World Wide Web at an exponential rate and people view these new media as the vehicles through which information will be accessed now and in the future. The objective is to provide a free, online resource that allows users to access information and photographs of ornamental trees, shrubs and vines so they can make informed decisions regarding the use of plant material. The UConn Plant Database currently contains information about 450 ornamental trees, shrubs, and vines, with over 2,000 cultivars and over 5,000 photographs. It also features a plant selector, online glossary, virtual campus plant walks and a dichotomous key. Work was continued to develop information for web pages of 300 new herbaceous ornamental plants.

b. Impact – Nurseries have access to employees with superior ornamental landscape plant knowledge. Nurseries, landscapers and homeowners can easily find information on ornamental landscape plants and make choices and decisions regarding their use that are most appropriate. Homeowners have free, continually available access to photographic and textual information on landscape plants. Courses at UConn and other universities use the website for instruction. The UConn Plant Database receives over 200,000 web page views per day from over 9,000 persons that visit the site each day. Numerous inquiries were received requesting use of the information and photographs for a variety of purposes. Landscape design firms are using the pictures and text as part of their design presentations, commercial nurseries and garden centers are linking to the pages, and homeowners send many questions in about plants after they have used the website. The United States government has even used some images for their publication. The website generates about 100 email plant material questions per month. Email feedback on the site has all been glowing and surveys of undergraduate students using the website as a resource in their plant materials courses has all been positive. A sample of user comments about the UConn Plant Database follows: “your website is one of the best online resources”, “it’s a favorite now – I think it is just wonderful!”, “Fantastic site! – by far the best”, “Best resource I could find either online or in print”, “better than the USDA plant web site”, “your site is easy to use and quite complete”, “I consider your site one of the plant ‘Bibles’”.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact – State

**Key theme – Green Industry**

a. Activity - A new study estimates that the Connecticut Green Industry is now worth \$2.35 billion annually, which is a dramatic increase over previous estimates of \$1.0 billion. Educational programmatic efforts were designed to enable businesses involved in the Green Industry to remain strong and thriving through provision of the latest research-based information. Two major conferences were planned and presented at the University of Connecticut, involving Department of Plant Science and Cooperative Extension faculty and staff. 400 professional horticulturists from around the New England area attended the annual Perennial Plant Conference and more than 350 gardening enthusiasts attended the annual Garden Conference.

b. Impacts - More than 74% of the attendees rated the Perennial Plant Conference as very good to excellent. More than 98% of the attendees rated the Garden Conference as very good to excellent, and approximately the same number agreed that they were now able to identify one or two new gardening practices that they would use during the upcoming gardening season.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme –Bilingual Needs Assessment**

a. Activity – It is estimated that there are around 23,000 migrant and seasonal workers in the Connecticut River valley region. However, little is known about the status and educational needs of these agricultural workers in Connecticut. Many of these workers are likely to be non-English speakers. A survey was conducted to assess the need for bilingual extension programs and educational opportunities on issues related to hiring workers from other countries. Results from the project were presented at the Latin American Immigration Policy and Human Rights in Connecticut Conference.

b. Impact – The project’s findings will direct the design of appropriate educational programs on topics such as pesticide safety, horticultural practices, worker safety, etc

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – UConn Home and Garden Education Center**

a. Activity – The Home and Garden Education Center at UConn is designed to address the needs of an increasingly sophisticated audience in a wide variety of issues including horticulture, food safety, soil testing, drinking water, home pest control and environmental/pesticide issues. Clients are educated in best management practices for pest control, soil and water quality, and plant cultural techniques. Education impacts have occurred from the Center activities at five levels: Extension Master Gardener program; statewide public outreach contacts via a toll-free Center phone number, email and Center visits; the Advanced Master Gardener Program; and community level outreach programs.

b. Impacts - The Center and the eight regional extension offices staffed by Extension Master Gardeners responded to over 10,000 questions from the general public. Issues addressed included insects, diseases, cultural problems in home gardens, food safety, wildlife issues, pests in homes, and water quality. Creation of the diagnostic laboratory has improved the Center's ability to diagnose and digitally document pest incidences.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Master Gardener Program**

a. Activity – There is strong public support to protect and enhance the natural, historical and developed environment. Actions taken at the individual level can have positive environmental and community consequences. The Master Gardener Program is designed to address these sorts of actions. The program focus is statewide, with an emphasis on the areas of urban and community horticulture, and historical and sustainable landscapes.

b. Impact - Of the 219 Master Gardener students enrolled in the Master Gardener Program, 180 (82%) became certified Master Gardeners through completion of 85 hours of in-class instruction and at least 60 hours as interns in the Extension Centers and/or community. Master Gardener's made 5,068 in-office contacts via telephone, mail and walk-ins resulting in diagnosis of over 2,166 different plant problems (insects, plant ID, etc). Master Gardeners volunteered over 5,400 hours at the county Extension offices. 681 students enrolled in 34 classes offered in the Advanced Master Gardener Program, with 24 completing course-work and becoming certified as Advanced Master Gardeners. Advanced Master Gardeners volunteered over 6,000 hours in a variety of community settings that involved 37 outreach projects in the areas of urban and community horticulture and historical and sustainable landscapes. As a result of the Master Gardener training 49 % of the students said they will change their gardening practices; 60% said they will implement the knowledge and practices presented to them after graduation; and 87% of Master Gardeners expressed interest in pursuing other educational opportunities as a result of the Master Gardener program.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact – State

## Goal 2 – A Safe and Secure Food and Fiber System

The Connecticut program was successful in this area with a variety of efforts conducted during the reporting period.

Extension and research efforts in the Hazard Analysis Critical Control Point (HACCP) system saw meat and poultry processors completing prerequisite programs to develop HACCP plans for their businesses.

In summary, the assessment of accomplishments is measurable in terms of the previously submitted 5-year Plan of Work. Total expenditures, by source of funding, and full-time equivalents for this goal are:

Goal 2		
Funding Source	Expenditures	FTEs
Smith-Lever	77,741	1.02
Hatch	1,250	0.02
Multi-state research	1,167	0.02
State funds	477,134	6.15
Competitive grants	43,778	1.01
Animal health	-	-
Total	601,070	8.22

### Key theme – Hazard Analysis Critical Control Point (HACCP) Training for Meat and Poultry Processors

a. Activity – In this time of HACCP based food safety, roles and responsibilities of industry have been redefined. While the USDA Food Safety Inspection Service (FSIS) sets food safety standards and conducts inspections and verification to make sure the standards are met, industry must design establishments, implement and monitor effective sanitation plans, develop and implement HACCP plans; monitor, verify and validate these plans; and make changes as warranted. This higher level of responsibility requires not only the initial HACCP training required by the regulation, but also an ongoing commitment to training and updating knowledge in highly sophisticated, science-based subject matter. The focus of this program is two-fold. First, to provide basic HACCP training for New England meat and poultry plants as required by FSIS. Second, to develop new and greater opportunities for Northeastern meat and poultry processors, who are characteristically defined as small and therefore, do not have the resources to engage in some of the programs provided in other regions of the United States. A two day HACCP course was developed and implemented in March 2006. Twenty-three persons attended from five states. This course was the only course offered in New England and New York and was critically important as all meat and poultry processors must have at least one HACCP-trained individual to meet USDA regulatory requirements.

b. Impact –24 participants in a Meat and Poultry HACCP training program reported that they learned new information and are now prepared to write plans so that they can comply with State and Federal regulations regarding HACCP and Pathogen reduction.

All stated that they learned something new or learned more about something they already knew for each of the listed items on the program agenda. 95% (20) listed at least one particular topic they learned as a result of attending the meeting, while 60% (12) enumerated changes they plan to make as a result of attending this program. The survey tool also elicited a list of additional training topics for future programs. Those mentioned most often included a program addressing specific pathogens and the control of them, especially *Listeria monocytogenes*; microbiology for the processor; sanitation; and basic training about HACCP for employees.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - Multi-state

**Key theme – Farm Animal Exhibit Education Regarding Hand Washing**

a. Activity – In the last five years there have been significant animal exhibit/fair/zoo related illness outbreaks, including: 22 confirmed cases of *E. coli* poisoning (and another 35 being investigated) traced to animal exhibits at three Florida fairs in 2005, 55 cases of *E. coli* were confirmed and one child needed a kidney transplant from her father after visiting a petting zoo in Pennsylvania in 2000, 15 cases of *E. coli* related kidney failure in children traced to a petting zoo exhibit at the North Carolina state fair in 2004. Visitors to fair and animal exhibits hope for positive outcomes of fun, education and, maybe, some interesting pictures for the family album. Unfortunately, farm and animal environments, including fairs and petting zoos where animals are exhibited, can be a breeding ground for bacteria and viruses that cause serious illness in humans. While *E. Coli* has been identified as the cause of most illnesses, it is not the only organism that can be spread by animals on farms or in zoos. Pigs, reptiles and birds (including chicks and ducklings), can carry *Salmonella*. A variety of animals, including cattle, deer and sheep, can carry the parasite *Cryptosporidium*. At the request of both the Connecticut Fair Association and the 4-H Youth Development program, a set of materials was developed in consultation with the State Veterinarian. Included were a handout and two posters encouraging hand washing after leaving animal exhibits and facilities, hand washing before eating, and other safety measures addressing “hand-mouth” activities such as eating, drinking, smoking and carrying toys and pacifiers.

b. Impacts - A survey of 4-H staff indicated that 100% used the materials at their 4-H fairs, reaching an estimated 4,800 participants or fair visitors. At least 4,800 participants in 4-H fair events were exposed to information (posters and handout) about hand washing after visiting animal exhibits, after using the rest room, and before eating at fair venues. In addition, the posters remained in the barns and rest rooms for additional events including a mid-size community fair. Posters were displayed at barn exits and entrances, rest rooms, and food service areas. Two fair organizers used the materials during training for 4-Hers, fair officers, and other fair volunteers. One used the materials when training 35 teens for the dairy program at Eastern States Exposition. One fair organizer created a display for use at the fair.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact – State

### **Goal 3 – A Healthy, Well-Nourished Population**

The Connecticut program was active and successful in this area with a wide variety of efforts conducted during the reporting period. A number of research and Extension efforts were implemented in the area of human nutrition.

A first-of-its-kind food security study identified pockets of food insecurity across Connecticut and helped lead to increased networking opportunities for emergency food providers.

Program participants in the Expanded Food and Nutrition Education Program (EFNEP) realized significant improvements in diets and food-related behavior, with reduced allocation of funds for food purchases.

Research on egg consumption and coronary heart disease risk resulted in an important recommendation not to eliminate foods such as eggs from the diet as there is no association between dietary cholesterol and CVD risk.

Research on the role of green tea in lowering blood levels of cholesterol suggested that green tea consumption may help reduce the risk of coronary heart disease.

Benefits to clientele and stakeholders who participated in this goal area were many; including improved efforts to address food insecurity across the state, better knowledge of nutrition needs by low income inner-city residents, and dietary approaches to reducing coronary heart disease.

In summary, the assessment of accomplishments is considerable, and is measurable in terms of the previously submitted 5-year Plan of Work. Total expenditures, by source of funding, and full-time equivalents for this goal are:

Goal 3		
Funding Source	Expenditures	FTEs
Smith-Lever	360,289	6.77
Hatch	18,599	0.08
Multi-state research	4,337	0.07
State funds	1,248,857	16.50
Competitive grants	427,918	9.00
Animal health	-	-
Total	2,060,000	32.42

#### **Key theme – Expanded Food and Nutrition Education Program**

a. Activity – For 36 years, EFNEP has been providing food and nutrition education in Connecticut to low income families with children, and low income youth, in order to improve eating patterns, shopping and food preparation skills, and dietary adequacy. Families are reached through collaboration with other agencies such as social service agencies, housing authorities, emergency food programs, schools and after school programs, day care centers, health clinics, etc. 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 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, chronic diseases and hunger. Recent data collected by USDA indicates that 7.6% of Connecticut households are food insecure and almost 3% of Connecticut households experience hunger. Households with children are twice as likely to experience food insecurity. While Connecticut still ranks number one in per capita income, the gap between the highest and lowest income families increased faster than most other states, and the number of working poor families with children has doubled. Child poverty has also dramatically increased. Between 30% and 47% of the children in the major cities live in poverty. Healthy People 2010's goals are to increase quality of years and healthy life and to eliminate health disparities. Promotion of healthy behaviors through increased physical activity and healthy eating is among the leading health indicators and behavioral approaches to address obesity, cardiovascular disease, diabetes and cancer, especially for minority groups. Healthy food choices and preparation methods, which incorporate the recommendation of the Dietary Guidelines and Food Guide Pyramid, are promoted through informal group and individual sessions among low income and limited resource families with children, low income youth and agency staff who work with these. Program topics meet participants' needs, but all include basic information about choosing foods to follow the USDA Food Guide Pyramid. Other topics include nutrition during pregnancy; 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. Some are presented in Spanish.

b. Impact – EFNEP staff partnered with over 100 agencies and community organizations in providing nutrition education programs to their audiences. 225 volunteers assisted EFNEP staff in conducting community based programs. 26 worked with youth, 199 worked with adults. 3% were former or current EFNEP participants. EFNEP Staff reached 579 homemakers representing 1,703 family members including 793 children. 69% “graduated”, completing on average 4.5 lessons over the course of 4.4 months. 52% participated in USDA food assistance programs. 69% live in metropolitan areas. 23% had incomes at or below 50% poverty, while 52% had incomes below 125% of poverty. 1880 youth were reached: 96% in urban/suburban areas and 4% in rural areas.

32 families enrolled in one or more food assistance programs as a result of EFNEP assistance or recommendation. Evaluation of the diets of adult homemakers (24 hour dietary recall) before and after nutrition education showed an overall improvement by 94% of the participants. The mean number of servings in all of the food groups increased, while the numbers of individuals consuming no food from the various food groups decreased. For example, for vegetables, the average number of servings increased from 2.3 to 3.5 per day. Those eating no vegetables decreased from 28% of the participants to only 9%, and those eating the recommended 3 or more servings of vegetables increased from 39% to 63%. Those eating no milk or milk products decreased from 40% of the participants to 20%. Those following the guidelines to eat 3 or more servings of dairy products increased from 18% to 29%. Nutrients such as dietary fiber, iron, calcium, and several vitamins also showed positive change. For example, before EFNEP education, 18% of the homemakers had diets containing 4 grams or less of fiber, while after EFNEP; only 4% had such low fiber levels. Food behavior evaluations of a sample of participants showed that 76% improved one or more practices related to food resource

management (planning meals, comparing prices, using grocery list, not running out of food at the end of the month), 81% improved in nutrition practices and 53% improved in food safety. Major improvements were seen in the numbers of participants more often planning ahead (45%) and thinking about healthy food choices (42%) using the nutrition label (53%), following recommended food safety practices (47%), and not running out of food before the end of the month (37%).

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

### **Key theme – Connecticut Food Policy Council**

a. Activity – The Connecticut Food Policy Council (CFPC) was established in 1997 by the Connecticut General Assembly to “develop, coordinate and implement a food system policy linking local economic development, environmental protection and preservation with farming and urban issues; review and comment on any proposed state legislation and regulations that would affect the food policy system of the state; advise and provide information to the Governor on the state's food policy.” Food policy refers to government actions that influence the availability, affordability, quality and safety of our food supply. Toward this end, the CFPC works on issues around emergency food, public food assistance programs, transportation access to food outlets, nutrition education, farmland preservation and initiatives to expand markets for locally-grown food. In order to develop sound food policy, it is important to have background information and understanding of the current situation around issues such as food insecurity and agricultural viability. A *Local Foods Conference “Home Plate: Putting Local Foods on the Menu”* was aimed at decision-makers from food service in major businesses, institutions, universities, schools and restaurants.

b. Impact –The local foods conference attracted over 100 participants. The vast majority of participants increased their awareness of the benefits of using local foods; the scope of agencies, businesses, schools and organizations involved in local foods projects; the concerns and barriers of local foods program in institutional settings; and governmental and institutional policies that can support local food projects. Many were inspired to bring what they learned back to their work, and over 20 indicated an interest in being involved in follow-up activities.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

### **Key theme - Community Food Security in Connecticut**

a. Activity - Government officials and advocacy group have a critical need to identify the food insecure population as a means of effectively targeting these groups and allocating scarce resources. A research project developed a statistical methodology to identify pockets of food insecurity across 169 Connecticut towns through 38 indicators as well as identify specific barriers to increased food security for each town. This is the first study of the kind in the country. The publication, “Community Food Security in Connecticut: An Evaluation and Ranking of 169 Towns” is available at [www.foodpc.state.ct.us](http://www.foodpc.state.ct.us). All Connecticut State Legislators received a

copy of the report, as did leaders in CT municipalities. Findings of the report on community food security show the concentration of community food insecurity involves poor urban centers such as Hartford and Bridgeport as well as many isolated rural towns in Northeastern CT. The community food security report has received recognition by legislators, including the National Conference of State Legislatures (NCSL), who convened a visit of regional legislators and leaders to Connecticut in June 2006 to look at the work of the CFPC.

b. Impacts - The impacts have been two-fold: (1) through the media, including three articles in state newspapers (Hartford Courant, Norwich Bulletin and the Journal), a radio interview, a 1000-word article in the newsletter of CEHDL (La Noticia de la Salud), 2,000 copies of a glossy brochure distributed to legislators, and a technical report; and (2) through personal presentations to legislators from the Northeast, stakeholders, and community groups. The project has also been a clearing house for information related to food security, such as the New Britain branch of Food Share for which a special report was produced in order to set priorities on the kinds of populations to be served and the more effective ways of allocating food and financial resources. As a result of this project, networking opportunities have increased for emergency food providers.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Nutrition, Fitness and Healthy Lifestyles for Individuals and Groups**

a. Activity – Chronic diseases such as heart disease, cancer, and diabetes are the leading causes of death and disability in the United States. Among minority and low-income populations, large disparities exist in regards to prevention of and early diagnosis and treatment of both acute and chronic disease. The focus of this initiative was to provide education and tools for the prevention of chronic disease by providing diet and health information to low-income populations in the greater Hartford area. 120 participants (family members and children with Phenylketonuria) attended the 6th PKU Family Weekend, a statewide initiative co-sponsored by the Genetics divisions at UCONN Health Center and Yale/New Haven Hospital. The weekend consisted of presentations, facilitation groups for parents of different age groups of children, and food demonstrations. Goals were to improve adherence to a low protein diet, improve metabolic control, and provide emotional support. Additionally, 180 low-income parents were reached by workshops, presentations, and individual counseling offered at multiple sites in the greater Hartford area. Workshops focused on healthy eating for children, management of food allergies in school settings, and kids and fitness. 200 youth participated in workshops on making healthy snacks and choosing snacks wisely. 15 student volunteers from the University of Connecticut and St. Joseph College assisted in outreach activities in EFNEP and Genetics to gain exposure to community nutrition. Three guest lectures in the nutritional management of inborn errors of metabolism were taught at St. Joseph College, Nutritional Sciences, Husky Reads Program at UCONN, and the clinical nutrition department at CT Children's Medical Center reaching 50 nutritionists and nutrition students.

b. Impact – 85% of children who participated in the PKU Family Weekend tried recipes at the Food Demonstrations and subsequently increased their diet variety at home. 80% reported being

better able to manage their diet and condition after attending the weekend. 90% of children who did blood specimens after the weekend showed better metabolic control. 75% of school staff attending a workshop on strategies for managing food allergies in school settings reported using workshop material to improve their school's policy on food allergies. 85% of parents participating in child nutrition workshops were able to identify dietary and sedentary lifestyle risk factors for the development of overweight/obesity in their children.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Dietary Cholesterol and Eggs**

a. Activity – During the last two decades, a large number of clinical studies and epidemiological surveys have investigated the relationship between dietary cholesterol and the risk of cardiovascular disease (CVD) and have shown that there is no relationship whatsoever. It is clear that eliminating foods with a high content of cholesterol from the diet –such as eggs- has very few beneficial effects in the risk of CVD and in fact can have a negative impact in the nutritional quality of the diet. It is of the utmost importance to know which dietary factors influence the lipoprotein profile and reduce the risk factors for CVD. When an individual decides to change his/her diet in order to lower plasma cholesterol concentrations, there are important recommendations that need to be followed.

b. Impact – An important recommendation is not to eliminate foods such as eggs from the diet just because they have a high content of cholesterol and to remember that there is no association between dietary cholesterol and CVD risk.

c. Source of Federal Funds – Hatch

d. Scope of Impact -State

**Key theme – Plasma Vitamin E Utilization Is Accelerated By Cigarette Smoking**

a. Activity – Nearly 50 million Americans smoke cigarettes contrary to the advice of numerous health agencies. Cigarette smoke contains approximately 5,000 chemical compounds and represents one of the greatest environmental sources of damage causing free radicals. Research was conducted to evaluate the extent to which cigarette smoking resulted in accelerated plasma vitamin E disappearance. Results demonstrated that cigarette smoking imposed a tremendous free radical burden that resulted in the accelerated loss of vitamin E that was corrected by improved vitamin C status.

b. Impact –Study results suggest that smokers should strive to consume adequate vitamin E and vitamin C in order to optimize plasma antioxidant status and potentially offset the deleterious effects of harmful free radicals.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Factors Affecting Bioaccessibility of Lutein**

a. Activity – Age-related macular degeneration (ARMD) and senile cataracts are major health concerns for the elderly in the United States. Approximately 25-30 million people suffer from ARMD in the U.S., and it is the most common cause of irreversible blindness in the elderly in this country. More than 50% of the people in the U.S. over 75 years of age have cataracts. Dietary lutein is thought to reduce the risk of these diseases. The egg is an important dietary source of lutein and of cholesterol. Research was conducted to determine if egg consumption increased serum lutein and therefore decreased the risk for ARMD and cataracts, but at the same time increased serum cholesterol and risk for heart disease.

b. Impact – More than 85% of the subjects in the research study had a significant increase in serum lutein after consuming eggs. Eggs provided a highly bioavailable source of lutein. Only 33% of the subjects had an increase in serum cholesterol after consuming eggs. When serum cholesterol increased, both HDL and LDL increased so the ratio of good to bad cholesterol did not change. Results suggest that moderate consumption of eggs may decrease risk for ARMD and cataracts without increasing the risk for heart disease, with eggs providing an inexpensive but highly bioavailable source of lutein. For healthy adults, moderate egg consumption will increase serum lutein, thereby decreasing the risk for macular degeneration and cataracts, without increasing the risk for heart disease.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Effects of Dietary Vitamin B-6 Deficiency on Glutathione Homeostasis in Mice**

a. Activity – Oxidative stress has been linked to the etiology of vascular diseases and certain cancers, neurological diseases, and inflammatory diseases. A key component of the antioxidant defense system is the tripeptide glutathione, which protects cells and organs from oxidative damage through enzymatic and non-enzymatic reactions. It is necessary to ensure the capacity of cells to synthesize cysteine in order to maintain appropriate glutathione homeostasis for protection against oxidative stress. This project focused on the effects of dietary vitamin B-6 deficiency on glutathione homeostasis in a murine model of oxidative stress. From these data two hypotheses were formed: (1) vitamin B-6 deficiency impairs the synthesis of cysteine and glutathione under conditions of oxidative stress, and (2) depletion of glutathione in vitamin B-6 deficiency increases susceptibility to oxidative damage.

b. Impact –The results of this study will help determine whether vitamin B-6 deficiency impairs glutathione synthesis and weakens the antioxidant defense system. This is of great interest because low vitamin B-6 status is common in older populations and in populations affected by inflammatory conditions, and these populations also show signs of oxidative stress. More broadly, results of this investigation will provide insight regarding whether vitamin B-6 deficiency could impair the response of the transsulfuration pathway to other known effectors, which include other physiological stresses, treatment with insulin and corticosteroids, and high and low intakes of dietary methionine.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Hypcholesterolemic Action of Green Tea Extracts**

a. Activity – Evidence suggests that green tea may lower the blood levels of cholesterol and retard the development or progression of atherosclerosis in animal models. Previous studies indicated that green tea extract suppresses the intestinal absorption of fat and cholesterol and lower the blood levels of lipids in rat models. However, the bioactive component(s) responsible for this action has not been clearly identified. Research focused on determining the effect of green tea extract (GTE) and its active compounds (catechins) on intestinal absorption of lipids in a rat model. Data showed that the green tea catechins are equally effective in lowering intestinal absorption of cholesterol and ineffective in lowering fat (fatty acid) absorption, suggesting that these catechins are at least partly responsible for the cholesterol-lowering effect of green tea.

b. Impact –Green tea consumption may help lower cholesterol absorption thereby reducing risk for coronary heart disease and may contribute to reducing healthcare costs associated with this disease, which is the leading cause of deaths in this country.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Vitamin A Regulation of Gene Expression**

a. Activity – In order to understand the role of diet in promoting health, it is imperative to delineate the role of specific nutrients in the human body. Research was designed to further define the numerous effects of vitamin A on gene expression by examining a specific model gene, that encoding phosphoenolpyruvate carboxykinase (PEPCK). Overall, the research shows the need for vitamin A to assure the correct differentiation and function of the liver in terms of carbohydrate and lipid metabolism. Potentially, this will increase the understanding of the role of vitamin A in the metabolic dysfunction that occurs in type 2 diabetes, metabolic syndrome, and obesity.

b. Impact – This is the first indication that a vitamin, in this case vitamin A, is critical for control of the metabolic complications of diabetes and obesity. Given an established association between diabetes and vitamin A status, individuals at risk for this disorder (based on family history and life-style factors) would be advised to maintain proper levels of dietary vitamin A intake as a protective measure. Such findings will have an impact on the overall health of the citizens of the state of Connecticut.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

**Key theme – Gender Differences in Protein Utilization in Healthy Trained Men and Women**

a. Activity – Recent national initiatives highlight the fact that men and women respond differently to a variety of diet and exercise interventions aimed at improving health. Differences in the use of carbohydrate and fat in response to acute, as well as chronic, aerobic exercise exist. Understanding gender differences in protein utilization will help characterize differences that exist between men and women and protein related metabolic responses to diet and exercise interventions in response to acute and chronic energy deprivation. Women displayed greater rates of skeletal muscle protein breakdown and more negative protein balance following an acute exercise bout than men suggesting gender differences in skeletal muscle protein turnover response to endurance exercise exist. Gender differences were also observed in the plasma substrate and hormone responses to exercise.

b. Impact –These findings contribute to the literature regarding different mechanisms by which males and females respond to exercise and provide a foundation for the development of gender-specific training programs and nutritional interventions.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

## **Goal 4 – Greater Harmony Between Agriculture and the Environment**

The Connecticut program was particularly active and successful in this area with a wide variety of efforts conducted during the reporting period

Programs were focused on both the local and national level through the highly acclaimed NEMO program (Nonpoint Education for Municipal Officials). At the state level, NEMO efforts resulted in programs delivered to representatives from virtually all Connecticut towns; with communities revising their comprehensive plans and/or taking other important public policy actions to better protect water resources. As a result of educational training, towns across the state are incorporating better stormwater management practices into their land use plans and regulations. On the national level, the NEMO Network expanded to 33 programs in over 32 states. NEMO Network programs assisted communities across the nation to better plan and design development.

The Green Valley Institute (GVI), designed to address the critical issue of natural resource conservation and land use planning in the Quinnebaug-Shetucket National Heritage Corridor, saw many outcomes, including the creation and revitalization of several conservation commissions, incorporation of natural resource inventory data in town master plans, and the adoption of new conservation subdivisions.

Extension education programs for agricultural producers resulted in participating farms reducing their nutrient usage in significant ways through nutrient management planning. Work led to a market study on the use of compost products in the state by the Connecticut Department of Environmental Protection.

Integrated pest management (IPM) research and education programs were targeted at most major crops in Connecticut. IPM programs resulted in significant reductions in usage of various pesticides and/or use of less toxic materials or approaches in pest management.

Research and extension efforts in the area of invasive plant species resulted in the development of a biological control project on purple loosestrife – a plant species that invades wetland areas. Purple loosestrife control is being realized across regions of Connecticut, and the public is demonstrating considerable interest in the overall issue of invasive species and means to manage the problem within the regional and local landscape.

Results from a paired watershed residential water quality project saw significant reductions in bacteria and nitrate-nitrogen leaving the targeted watershed as a result of the application of numerous changed landscape management practices.

Benefits to clientele and stakeholders who participated in this goal area were many, including improved land use public policies at the local and regional level, improvements in water quality management techniques, enhanced agricultural operations that are economically viable, and environmentally protective, attractive and functional communities.

In summary, the assessment of accomplishments is considerable, and is measurable in terms of the previously submitted 5-year Plan of Work. Total expenditures, by source of funding, and full-time equivalents for this goal are:

Goal 4		
Funding Source	Expenditures	FTEs
Smith-Lever	495,278	6.64
Hatch&Mc-Stennis	34,300	0.57
Multi-state research	9,462	0.16
State funds	3,338,640	43.70
Competitive grants	640,320	13.28
Animal health	-	-
Total	4,518,000	64.35

**Key theme – Nonpoint Education for Municipal Officials (NEMO) Program.**

a. Activity – The impacts of poorly planned land use on the natural resources, economic vitality, and local character of our nation’s communities are well documented. Local land use decision makers in Connecticut’s municipalities need information and tools to assist them in planning the growth of their communities while protecting natural resources, particularly water resources. For the past five years, much of NEMO’s work has been through an educational program called the Municipal Initiative, which creates long-term relationships between the project and select Connecticut communities. During the year, three new towns were brought into the program. In addition, a new project with CTDEP was begun, focused on statewide education on the new Connecticut Stormwater Quality Manual. In addition, NEMO researched, wrote and published the booklet “Putting Communities in Charge,” which profiled both the program and planning initiatives being implemented by towns with which the program works. Over 60 educational workshops for local officials were conducted on a variety of topics. The Connecticut NEMO Update newsletter featured the results of the Municipal Initiative and highlighted upcoming projects. NEMO collaborated with Connecticut Department of Environmental Protection (DEP) to develop and organize statewide training workshops on a new DEP publication, the 2004 Stormwater Quality Manual. NEMO team members worked with DEP and a steering committee of state agency representatives and private professionals, in the development of the manual. The manual provides guidance to both land use decision makers and development professionals on stormwater practices to protect water quality. NEMO team members conducted 20 workshops, reaching nearly 1,000 local land use decision makers, design engineers, state agency personnel, and town staff. The project created two new educational workshops: (1) Managing Stormwater in Urban Areas, (2) Low Impact Design for Contractors and Builders. A new web site (<http://clear.uconn.edu/planning.htm>) focused on research on impervious surfaces, both conducted at UConn and across the country, was developed and posted.

b. Impact – The Town of Killingly included information from the NEMO workshop series into their town’s Plan of Conservation and Development. The town has modified their subdivision regulations to allow for environmentally responsible design and to modify road design to lessen impacts on water quality. The town is in the process of updating zoning regulations. The City of Torrington updated their regulations and policies to include a number of Smart Growth principles and reduce the impact of both development and redevelopment on natural resources.

The Town of Killingworth completed a community resource inventory. This inventory will be used as a basis of a town plan update. The town also formed an Open Space Planning Subcommittee that will use the resource inventory to prioritize lands for preservation. The Planning and Zoning Commission made changes to their zoning and subdivision regulations based upon the NEMO workshops. Nearly 1000 engineers, town staff, land use commissioners, state agency representative were educated on the CT Stormwater Quality Manual. As a result of these workshops many towns are incorporating the practices outlined in the manual into their regulations. The professionals in the development field have also begun to use the manual as a standard reference text. The upshot of both the publication and the subsequent training workshops is that both the decision makers and the development community have a single source on which to design and evaluate development proposals. As a result of educational training provided by the NEMO Program, in partnership with the CT Department of Environmental Protection and the firm of Fuss and O'Neill Engineering, towns across the state are incorporating better stormwater management practices into their land use plans and regulations.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – National NEMO Network**

a. Activity – Many national agencies and organization have recognized that better land use practices are needed to protect our nation's natural resources, particularly given the fact that nonpoint source pollution, or polluted runoff, is the number one source of water pollution in the United States. USDA's Water Quality Program, NOAA's Coastal Ecosystem Health Initiative, and EPA's Smart Growth and Water Strategies all call for the problem of nonpoint source pollution to be addressed. The Nonpoint Education for Municipal Officials (NEMO) Project of the University of Connecticut Cooperative Extension System is a national award-winning program that educates local officials on the links between land use and water quality. NEMO has become a national model for groups in other states wishing to target land use officials for water resource education. Since 1998, the Connecticut NEMO Project has served as the coordinating "Hub" of the National NEMO Network, a group of affiliated projects patterned after the original UConn project. The Network exists to share information, and educational tools and models, to the betterment of all the participating projects. The Connecticut Hub provides training, advice, and a wide range of communication services to the Network, from web-based services to the organization of the annual "NEMO U" Network conference. Four scoping or training workshops were conducted, involving three states, to initiate or assist NEMO Network projects. New Jersey, Vermont, Florida, and Oregon were involved. The Program coordinator from Vermont visited the hub during the reporting period for one-on-one training/education sessions. A regional Low Impact Development (LID) training was held for NEMO programs and their partners in the Northeast. The hub helped plan and participated in a regional meeting of Southern NEMO programs. A Network-wide GIS and Remote Sensing workshop was held at the Coastal Services Center in South Carolina. Presentations were given at three national conferences: plenary presentations at the USDA CSREES Water Quality Conference and the Association of Natural Resource Extension Professionals (ANREP) Conference, and a keynote at the National Nonpoint Source Monitoring and Modeling Conference. A special workshop was also given at the Southern CSREES Water Quality Conference in Lexington, KY. Two issues of

a Network Newsletter were written and distributed (both electronically and in hard copy). A second Progress Report on the National NEMO Network was issued highlighting the impacts of NEMO programs from around the country. The report was based on a web-based impact reporting form, which was created and implemented on the “Members Only” portion of the National NEMO web site. The report, *Charting a Course for Better Land Use*, was distributed. Planning for NEMO University V (aka Cinco de NEMO) began for the fifth national conference of NEMO Network principals.

b. Impacts - New NEMO programs were initiated in Vermont, Florida, and Oregon. NEMO Network programs are assisting communities across the nation to better plan and design development. The National NEMO Network now includes 33 programs in 32 states, each involving a wide variety of partner organizations and all patterned after, and supported by, the University of Connecticut Cooperative Extension. The National NEMO Network released its second progress report, *Charting a Course for Better Land Use*, which provides a sampling of local actions that have been catalyzed by NEMO programs. The first Network progress report, issued in 2003, focused on how the various NEMO programs developed, how they were structured and what they had begun to accomplish. Now that the Network and many of its programs have been around for a few years, those accomplishments have grown into a truly impressive body of work. Therefore, the report focused on “impacts”—the local actions that have been catalyzed, initiated, supported by or in some other way set into motion by NEMO programs. From changes to community plans to improved land use regulations to on the ground changes, it is clear that education is working in communities across the country. The report has been distributed far and wide within the Extension and Sea Grant networks, to our many federal and state partners, to a few folks in Congress, and all members of the Network and their partners.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

### **Key theme – The Green Valley Institute**

a. Activity – The Quinebaug-Shetucket National Heritage Corridor (QSHC) is a 35-town region in eastern Connecticut and south-central Massachusetts, officially recognized by the National Park Service as having natural, cultural and historic resources of national significance. The region has been nicknamed “The Last Green Valley” because night-time satellite images clearly show it as the last dark spot in the Boston to Washington DC coastal megalopolis. The Corridor’s population grew 4% between 1990 and 2000, and is projected to grow an additional 20% by 2020. The rate of growth in rural communities was more than triple that of the urban areas. Preserving environmental quality and viable agriculture in the last green valley, in the face of these pressures, will require unprecedented inputs of education and information to several key audiences. Chief among them are: 1) private farm and forest owners, who control 80% of the Corridor’s land, and 2) municipal officials and commissioners, to whom virtually all authority to plan for and regulate land use has been delegated. This latter audience is overwhelmingly populated by lay volunteers who are in chronically short supply and often poorly supported with education and technical support. An enhanced Corridor-wide G.I.S. database on natural and agricultural resources was made available to Corridor towns on request for planning purposes; a

total of sixty-eight Green Valley Institute (GVI) short courses, workshops and training sessions were taught to 1,379 Corridor community leaders, landowners and interested citizens.

b. Impact –GVI provided assistance to four additional Corridor communities in the development of community resource inventories, bringing the total to 22 since 2001. At least 19 of those have utilized the data to develop municipal conservation priorities. Thirteen have, or are in the process of, incorporating the data into master plans/plans of conservation and development; and at least 12 are utilizing them in reviews of subdivision/land use change proposals. Two workshops on Protecting Family Farms and Forests were attended by 42 landowners; in addition, GVI staff had 19 meetings with individual landowners in 15 towns and with 6 land trusts. These efforts have resulted in at least 2,217 acres of additional land that is now in the process of, or have been permanently protected. During the period, GVI assisted three additional Connecticut Corridor communities in forming new Conservation Commissions. GVI has now helped 11 Connecticut towns create new Conservation Commissions or revitalize inactive ones, and one other has a conservation subcommittee. With GVI's help, these Commissions are developing and maintaining natural resource inventories and utilizing them to improve the knowledge base from which planning and subdivision review decisions are made. In partnership with The Nature Conservancy and the Windham Region Council of Governments, GVI developed a computerized method for overlaying multiple natural resource maps and producing a single prioritized map of “co-occurring” natural resources areas for conservation planning. GVI taught and assisted four additional communities in utilizing this process. To date nine communities are now utilizing these maps in their resource planning. In 2005, GVI conducted a survey of attendees from previous GVI workshops to determine the impact the workshops have had on their communities: 73% have actively supported open space planning in their town, 35% supported development of design guidelines in their town, 43% now support local open space funding efforts, 55% have discussed the pros and cons of community growth with others, 40% have promoted Smart Growth strategies, 30% have taken steps to develop, or have developed, an open space plan. GVI and The Nature Conservancy co-coordinated an effort involving 7 towns in the Natchaug River basin on Conservation Planning. The Natchaug River received formal State Greenways Status in 2006. As a result, GVI's GIS center supported NE Connecticut Audubon's Citizen Science with watershed basin maps used for stream monitoring protocol on Mashamoquet Brook. Results are currently being evaluated by NRCS and DEP for stream condition and quality threats. GVI continues to provide support to 76 conservation volunteers recruited and trained by GVI. To date 121 volunteer hours have been spent monitoring 24 stream segments totaling 16 miles, and volunteers with the CT Amphibian Monitoring Program (CAMP) have spent 57 hours monitoring 10 sites and have identified 11 species including one rare threatened species never previously identified in Eastern CT. GVI, in partnership with University of Connecticut Landscape Architecture Program, provided assistance to Corridor communities with specific land use planning concerns. 26 landowners, owning a total of 1,373 acres attended the second 6-part Forest Stewardship Short Course. As a result of attending, 100% planned to either update an existing forest management plan or engage a professional forester to develop one, 85% plan to implement forest or wildlife stewardship practices on their land over the coming year. In 2005, GVI received the National Public Education Award of the American Planning Association, which stated that “An informed leadership is absolutely essential to understanding the complexities of the cause-and-effect relationships of land use and decision making. GVI's program is a model for all of us.”

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – The Green Valley Institute/Community Planning and Design**

a. Activity – The towns in the Quinebaug Shetucket Heritage Corridor are feeling significant development pressure. Thoroughfares and villages are slowly being developed, and acre-by-acre the rural character of this area is changing. Commercial development has the benefit of bring services, jobs and tax revenue to a community. However, commercial development can forever change the character of a community. New development can be planned so the rural character is enhanced or is minimally impacted. The Green Valley Institute is helping Heritage Corridor communities address growth and development issues from many angles – including education programs about community planning and design and community planning fact sheets.

B Impact – The Towns of Coventry and Windham adopted Design Guidelines and related regulation changes. Griswold, Ashford and Woodstock adopted new conservation subdivision regulations. Southbridge, MA got a QSHC grant to develop a street festival similar to Third Thursdays in Willimantic.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Natchaug River Greenway Designation**

a. Activity –The Natchaug River System is recognized by federal, state, local and private agencies as a benchmark stream for water quality containing a rich diversity of aquatic and terrestrial plants and animals. The Natchaug provides recreation, history and beauty to area residents and visitors as well as supplying drinking water for the City of Willimantic and parts of the Town of Mansfield. Promoting local and statewide awareness of the important resources associated with the Natchaug River System through nomination as an official State Greenway brings attention to the existing high water quality and initiates regional strategies for protection against threats to the river. Four planning workshops were conducted with 28 stakeholders to develop the greenway proposal, a presentation on the Natchaug River Greenway proposal was delivered to 85 land use commissioners, selectmen, and local partner organizations and the Natchaug River Greenway Nomination was submitted to CT DEP Greenways Council on March 1, 2006.

b. Impact – The Natchaug River Greenway will be included in the next version of the Office of Policy and Management State Plan of Conservation and Development. As a result of the Greenway designation a group of local stakeholders will conduct a strategic planning workshop to develop a watershed management plan identifying specific actions for water quality protection. Recognition of the Natchaug River System as an Official Connecticut State Greenway has initiated regional planning for water quality protection and provides new funding potential throughout the watershed.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme - Building Municipal Government Capacity to Prioritize and Conserve Natural Resources**

a. Activity - Planning for and implementing landscape scale conservation and management of natural resources in Connecticut is almost entirely delegated by law to the state's 169 incorporated municipalities. Municipal Conservation Commissions are charged with developing and managing natural resource inventories, and utilizing those inventories to: inform the municipal land use planning processes, e.g. the state-mandated Plans of Conservation and Development, and inform the land use change review process, especially proposals for residential subdivisions and commercial development.

Traditionally, the majority of Connecticut municipalities have formed combined Conservation and Inland Wetlands Commissions, and charged these joint commissions with regulation of the Inland Wetlands Act in addition to the conservation work outlined above. Research by the Connecticut Association of Conservation & Inland Wetlands Commissions has shown that in these cases, less than 10% of the combined Commission's time is spent on pro-active conservation, and as a result natural resource inventories and their use are generally sub-optimal.

b. Impact – Extension, through an educational partnership of the above organizations known as The Green Valley Institute (GVI), has guided ten Connecticut communities in the QSHC through the process of forming and filling new, stand-alone Conservation Commissions since 2001, including two in 2005. Since 2001, GVI has guided or assisted 21 QSHC communities in the development of digital, state-of-the-art natural resource inventories. Nine of these communities have also worked with GVI to develop "co-occurring resource" data layers, i.e. computer generated maps that identify geographic areas with the greatest number of important natural resources occurring on the same site.

A mail and phone survey completed in early 2006 produced responses from 15 of the 21 communities (71%). Twelve (80%) either have or are in the process of using these natural resource inventories in municipal plans of conservation and development and/or municipal open space plans. Eight (53%) are regularly using the inventories to assess the potential impacts of subdivision and other land use change proposals.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Lands of Unique Value**

a. Activity – Land use sprawl has created interest in ways to address future development. Research efforts were conducted to demonstrate an innovative approach to local land-use planning to intelligently and pro-actively plan for smart growth in the future. The "Lands of Unique Value" study for the Town of Mansfield created an inventory of Mansfield's natural, cultural and visual features and provided recommendations for future land uses and associated regulatory revisions for land under municipal regulatory jurisdiction.

b. Impact – It is expected that the "Lands of Unique Value" vision will be incorporated into the town's Plan of Conservation and Development and zoning regulations and into the region's Growth and Preservation Guide Plan. Local decision-makers will be provided with a flexible and accessible land management document to help guide decision-making on a daily basis.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme –Geospatial Technology Program.**

a. Activity – The primary focus of the Geospatial Technology Program (GTP) is to introduce municipal land use decision makers, planners and regulators, state agency staff, NGOs and businesses to geospatial technology – geographic information systems, global position systems, image processing, digital map data and remotely sensed satellite and airborne imagery. This is accomplished through a series of informal workshops, presentations, websites and custom developed hands-on technology training courses that focus on geospatial applications of importance to Connecticut organizations. The GTP conducted five five-day “Geospatial Technologies at Work” hands-on training courses five two-day “Introduction to GPS” hands-on training courses, maintained a GTP website that lists courses, schedules, research projects and other pertinent information collaborated with colleagues in RI and NH to develop and offer workshops at regional locations that address priority topics of interest to geospatial practitioners, and participated in research projects that demonstrate how geospatial technologies can be used to address problems of concern in Connecticut.

b. Impact –As a result of a past GPS training course, a program was developed in Groton for the assessor to use GPS technology to rapidly update the department’s CAMA database. This has resulted in more accurate and current data in the town’s GIS. GTP was asked to assist the town of East Haddam prepare and assess a GIS-based community build-out analysis that identified the potential location for future development. As a result of the analysis, the Planning and Zoning Commission is reviewing local plans and will be making changes to land use policies and regulations. Similar work was done with the Northeast Council of Governments for the town of Pomfret where the results of the build-out analysis are being evaluated relative to current plans and regulations.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Connecticut Tree Warden School and Certification Program**

a. Activity – 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 possess. 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.

b. Impact – On scales of 0 (poor) to 4 (excellent), Tree Warden School participants rated the school program 3.83 in terms of knowledge gained, with 3.89 in the applicability of the information to their Tree Warden duties. All participants found the final exam to be difficult, yet fair. Tree Wardens were educated in tree biology, tree care, hazard tree assessment, public participation, tree law, and meeting management during five half-day sessions, one day per week in the fall. An annual event, the Tree Warden School each year provides up to 30 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. Partners include DEP and TWACT.

In eight years, 216 Tree Wardens, Deputy Tree Wardens and others have gained new knowledge concerning Tree Warden duties and responsibilities through the Tree Warden School. This means that 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 that chief elected officials have begun appointing more qualified people to the Tree Warden position. These people often are foresters or arborists who then 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. Both these states have laws that, like Connecticut, require the appointment of Tree Wardens in municipalities but do not require any minimum qualifications.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Connecticut Urban and Community Forestry Volunteer Initiative**

a. Activity – 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 receive quality and timely community forestry education and training are able to augment community forestry efforts. The Meskwaka Tree Project is one of the more important facets of the urban and community forestry initiative and was created to provide such necessary urban and community forestry educational opportunities and programmatic support.

b. Impact – In the twelve years of the existence of the Meskwaka Tree Project, all participants said they would recommend the program to other community forestry volunteers. Participants are required to return to their communities and perform community or state based urban and community forestry volunteer programs.

Volunteers were educated in urban and community forestry including tree biology, tree care, fundraising, media relations, community affairs, meeting management, tree law, and marketing. An annual event, the Meskwaka tree Project is designed to provide municipal volunteers with basic educational background and contacts to either initiate new or support existing urban and community forestry programs, either in their municipality or on a state-wide basis. Partners include USFS, DEP, and Connecticut College Arboretum.

Since 1992 over 263 urban and community forestry volunteers have been trained. Participants have come from 75 Connecticut communities and three states. Since 1992, volunteers have been the initiator or participant in the following example outcomes: 42 communities have written and passed shade tree ordinances; 30 shade tree commissions have been established; about 5,871 new public trees have been planted; twenty-one 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. The Maine Community Forestry Program has created an urban and community forestry program modeled after the Meskwaka Tree Project was launched in the spring of 2001.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Forest and Wildlife Stewardship in Connecticut**

a. Activity – Connecticut's 1.8 million acres of forest provide raw material for over 350 forest products processing and manufacturing firms, which employ 3,600 citizens and contribute over \$450 million annually to the state's economy. They also clean our air and water, provide habitat for wildlife, and provide recreational opportunities for nearly a million citizens each year. Almost 85% of Connecticut's forest is privately owned. Research shows that Connecticut is losing some 6,000 acres of commercially harvestable forest annually to development and fragmentation, and that the average forested parcel size has declined 34% over the past 20 years. The stewardship program targets Connecticut's 115,000 private forest landowners to enhance their knowledge about good forest stewardship, and to increase the forested acreage under long-term stewardship plans by moving as many owners as possible through the stages of stewardship planning practice adoption. 1,616 people attended educational tours of managed forests belonging to program volunteers, 41 attended formal indoor forest and wildlife stewardship workshops and/or presentations arranged and/or presented by program and 6,775 acres of new or updated stewardship plans were developed.

b. Impact – Habitat improvement and timber stand improvements were implemented on 1,409 acres, knowledge and information was gained by at least 321 additional forest landowners who began new stewardship programs or enhanced existing stewardship programs on at least 2,074 acres.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Land Conservation Techniques and Service Implementation: Assessing Context-Sensitive Priorities for the Policy Process**

a. Activity – Research was conducted to inform efficient, cost-effective use of land preservation dollars by comprehensively evaluating public preference for the non-market services of land preservation and the ways in which these services can be provided.

b. Impact – Results demonstrated that that the rural public may not only be concerned with the consequences of farm and forest preservation; residents may also have systematic preferences for the policy instruments applied to preservation goals. There is increasing recognition among academics and policymakers that the rural public may not only be concerned with the consequences of land management; residents may also have systematic preferences for the policy instruments applied to management goals.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Evaluating the Sustainability of Coastal Tourism**

a. Activity – Operational definitions of coastal tourism sustainability require details regarding what is to be sustained, for whom it is to be sustained, and the level at which it is to be sustained. This research project, implemented in partnership with Dr. Timothy Tyrrell at the University of Arizona, developed a dynamic model illustrating the interrelated behavior of tourism-related economic and environmental conditions over time. The model demonstrates that in all but the rarest of circumstances, there is no single, universal sustainable optimum.

b. Impact – This research project illustrated critical tradeoffs in the search for sustainable solutions for coastal tourism. A policy that maintains overly pristine environmental quality may be just as unsustainable—from the perspective of either the tourism industry or residents—as a policy that causes excessive environmental decay.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Estimating Non-Use Values for Reductions in the Entrainment and Impingement of Fish in Cooling Water Intake Structures**

a. Activity – Over the past five years, the U.S. Environmental Protection Agency (EPA) has been in the process of developing new Phase II and III regulations to provide national standards for controlling impacts from cooling water intake structures (CWIS) under section §316(b) of the Clean Water Act (CWA). The facilities affected under these regulations are those that withdraw water for cooling purposes from rivers, streams, lakes, reservoirs, estuaries, oceans, or other waters of the United States. The impacts of cooling water intake include entrainment and impingement (I&E) of fish and shellfish; reductions of threatened and endangered species; and stresses to overall ecosystems as evidenced by reductions in diversity and other changes in system structure and function.

b. Impact – This research project assisted the Environmental Protection Agency in assessing the net economic benefits of the proposed US EPA 316b Rule, which would reduce allowable entrainment and impingement of fish in power plant cooling structures.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Sustainable Management of Dams**

a. Activity – Many of the world's dams and reservoirs are losing their storage capacity due to sedimentation. This process can be slowed down by watershed management or reservoir level sediment removal. Interdisciplinary research (involving civil engineers and economists) was

being carried out to determine sediment management strategies for any given dam that would be optimal from an economic perspective and meet technical feasibility criteria.

b. Impact – Over the last year, many requests for this work have come from different parts of the world. One of the project's publications has been translated into the Chinese language. Prior publications and computer software to support sustainable management of dams are available from the website <http://vm.uconn.edu/~wwware/SustDams.htm>.

c. Source of Federal Funds – Hatch

d. Scope of Impact - International

### **Key theme – Taste Buds and Environmental Convictions in the Seafood Market**

a. Activity – The objective of this project was to test the hypothesis that when faced with a purchase decision where the alternatives are different fresh seafood species, prices and presence or absence of an ecolabel, the consumer will choose based on the species (taste) more so than presence of an ecolabel or price.

b. Impact – Model results point to limitations in the ability of ecolabels to influence behavior in multi-species choice settings. While results indicate a statistically significant willingness to pay to obtain labeled seafood of a particular species, they also clearly indicate that consumers are not willing to sacrifice their most favored (by taste) seafood species in order to obtain a less-favored species bearing a no-overfishing ecolabel—even at average prices for both products. Survey results clearly demonstrate that despite numerous campaigns designed to promote environmentally conscious seafood purchases and modify consumers' seafood purchasing habits, consumers do not yet appear willing to sacrifice favored seafood products in exchange for an ecolabel.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

### **Key theme – The Financial and Clinical Implications of Adult Malaria Diagnosis using Microscopy in Kenya**

a. Activity – During a study undertaken at 17 health facilities with microscopy in Kenya it was demonstrated that potential benefits of malaria microscopy are not realized because of irrational clinical practices and the low accuracy of routine microscopy. Using these data, financial and clinical implications of revised clinical practices and improved accuracy of malaria microscopy were modeled among adult outpatients under the artemether-lumefantrine (AL) treatment policy for uncomplicated malaria in Kenya.

b. Impact – Policy recommendations from this study estimated a 22% reduction of total treatment cost for adult outpatients in Kenya while substantially improving clinical practice. This analysis convinced the Division of Malaria Control of the Ministry of Health to include these clinical practice guidelines into Kenya's newly revised guidelines for adult malaria case management.

c. Source of Federal Funds – Hatch

d. Scope of Impact - International

**Key theme – Nutrient Management Planning**

a. Activity – 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. Concentrations of P 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. The Nutrient Management Program (NMP) program is teaching farmers to manage manure environmentally as well as agronomically. The majority of the P is coming onto the farm in purchased feed - rather than the fertilizer as one might expect. Farmers learn to balance rations to more closely match P consumption to uptake to decrease the level of P in manure. There is limited opportunity to move manure off the farm, particularly liquid dairy manure. 10 Farms are currently implementing plans and recording data. No commercial dairy farm on the project has enough land to spread manure under a strict P standard. Implementing a NMP forces farms on average to double their manure hauling costs by forcing farms to transport manure twice as far from the barn. To comply with the NMP farms were asked to haul manure 20,548 miles. Hauling costs went from \$15,026 TO \$ 109,618. Together these livestock produce 7,915 tons of solid manure and 26,715,844 gallons of liquid manure annually.

b. Impact – Results demonstrated that complying with a nutrient management plan increases farmer's manure hauling cost by more than double. An outcome of the project is activity by the Connecticut DEP to conduct market research to find alternatives uses for the manure to determine if a market exists for compost from regional manure composting facilities.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme –Fenton River Study**

a. Activity – Research was conducted to assess impacts of the University of Connecticut's water supply wells on the flow in the Fenton River and resulting habitat losses for fish. The study integrated various hydrologic and biotic components such as the ground water drawdown due to pumping, changes in flow in the river under different weather conditions, and the variation of habitat types for different portions of the river under different flow regimes and the use of those habitats by different species of fish. The report is available at [www.ctiwr.uconn.edu](http://www.ctiwr.uconn.edu) .

b. Impact – Recommendations in the report provide guidance to help professional water managers understand the impacts of the wells and how to minimize impacts on stream flow

through better management of the system. Seminars helped educate the scientific community and public about the need for water conservation and the value of studies.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Jordan Cove Urban Watershed Project**

a. Activity – Nonpoint source pollution is the primary cause of water quality problems in Connecticut and the U.S. Urban runoff contributes to impairment of 5% of river miles, 8% of lake acres, 18% of estuaries, and 7% of wetlands. There is need to reduce nonpoint source pollution to the Nation's water bodies to meet the goals of the Clean Water Act. The effectiveness of urban management practices to reduce nonpoint source pollution is largely unknown. BMPs were installed and water quality was monitored and analyzed. Surveys were conducted of residents in the neighborhoods. The target audiences were primarily state and Federal agency personnel as well as the citizens of Connecticut as contributors to nonpoint source pollution.

b. Impact – Results show that urban BMPs can be used in low impact development design to reduce runoff to one tenth of traditional development. The volume of stormwater runoff from the BMP Watershed decreased (-97%) during the construction period and remained lower than expected (-78%) during the post-construction period. During construction, the concentrations of TSS, TP, NO<sub>3</sub>, NH<sub>3</sub>, and TKN increased. Following construction, TSS, TP, and TKN concentrations remained higher than expected but metals decreased. Concentration peaks during construction were associated with turfgrass development. Exports generally did not change during the construction period, except for TP which increased. Following construction, exports generally decreased. During construction and following construction, stormwater runoff from the traditional watershed increased. Exports increased for all variables during both construction and post-construction periods, except for Pb. The increase in flow controlled these export increases. The erosion and sediment controls used during construction appeared to work at this site.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Dissipation of MTBE ground water contamination following the State MTBE gasoline ban**

a. Activity – MTBE, a gasoline additive, has become a ubiquitous ground water contaminant. In January 2004, the use of MTBE in gasoline in Connecticut was banned. Research was conducted to assess the effectiveness of the ban in dissipating ground water contamination in Connecticut.

b. Impact – Results found the MTBE diminished within a year to near non-detect levels. Interest in research results is high, including the American Petroleum Institute(API) holding a meeting at UConn, an invited presentation at the EPA National Underground Storage Tank Meeting, and contact by the State of New Hampshire, which is banning MTBE in 2007, to conduct a survey of gas stations to evaluate MTBE dissipation.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Holistic Modeling of Dynamics of Biological Systems**

a. Activity – Studies on transport and conversion processes of energy and biological materials in the environment are critically important to our homeland security as well as to the scientific advancement in the fields of environmental pollution, water resources sustainability, applied meteorology, and environmental modeling. Research focuses on integration of hydro-meteorological, ecological, and economical processes at the regional scale and to develop a cascade of holistic models that can be used in examining the causation of multi-media environmental problems.

b. Impact – The developed multimedia modeling has drawn a lot of attention in the scientific community. It may replace older models used by government agencies for studying and regulating purposes, and has been used in projects of the Connecticut River Airshed-Watershed Consortium. The model has been applied to assess the agricultural production and water resources sustainability in the Yellow River basin, China.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Human Dimension on Coyotes**

a. Activity – Coyotes came to Connecticut in the 1950's and since then they have been interacting with humans at different levels. In the past few years an increase in coyote/human interaction has been noted. Little is known about coyote behavior and coyote/human interaction in rural versus urban areas. A survey gathered information about general observations of these and other mammals in Connecticut towns.

b. Impact – Response to the survey was very high, over 41%. Results indicated that residents are highly interested in the coyote behavior, especially if they have children and pets. Over 70% of the respondents valued coyotes as predators, about 70% believe that coyotes are found at the optimum carrying capacity, and they do not want to see more coyotes in their area. Over 60% of the respondents indicated interest in information about management, protection and/or control of the coyote.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

**Key theme – Evaluation and Development of Best Management Practices for Turfgrass**

a. Activity – 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. Research evaluated new technologies that will improve N fertilizer recommendations for turfgrass. The results will be of use to homeowners with lawns, and 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. Two manuscripts were published in peer-review journal articles reporting on the results of fertilization practices on turf and water quality. A third manuscript is undergoing revision after review in a peer-review journal; and a fourth manuscript has been submitted to a peer-review journal. Presentations of research findings were given at the Northeast Branch meeting of the American Society of Agronomy, Soil Science Society of America. The research was quoted in a Hartford Courant article. Four presentations emphasizing the research data were given to turfgrass industry groups and water quality associations.

b. Impact – The results from the research suggest that fertilization practices (rates, timing, and 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 anion exchange membranes and hand-held reflectance meters 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 to develop demonstration sites and provide information on lawn care decisions that can affect water quality.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Managing the Homesite for Water Quality**

a. Activity – Many residential activities can contribute to the contamination of surface and groundwater. Understanding the basic science of water movement and how activities such as maintenance of the home landscape and preventive actions with wells and septic systems can result in reduced negative impact on Connecticut water resources is critical in the protection of CT water resources. The *Managing the Homesite for Water Quality* program was presented to over 155 Master Gardener participants. Content includes explanation of nonpoint source pollution, watersheds, surface and groundwater issues, best management practices for landscape management for residential properties and management of home water systems (wells and septic systems).

b. Impact – Of the 158 participants in the Master Gardener classes, 100% learned at least one new concept related to managing the home landscape to protect water resources and 86% will change one gardening practice.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

**Key theme – LAWNS/Water and Nutrient Strategies to Protect Water Resources**

a. Activity –Landscape management, and in particular management of home lawns by the homeowner and/or landscape manager, can seriously impact the quality of water in Connecticut. Concern with water resources has spurred research on nutrient needs and timing as well as alternative species which have lower nutrient and water requirements. LAWNS (Learning About Water and Nutrient Strategies), a research and extension collaboration for the residential sector, was developed to support the implementation of environmentally sound nutrient management practices and to learn about less resource demanding turf species. Master Gardeners received turf-specific training and provided expanded outreach capabilities for the program. The Residential Water Quality Sustainability web site (<http://www.sustainability.uconn.edu>) received over 1,600 hits in 8 months of operation. Master Gardeners contributed over 260 volunteer hours to education programs, and along with the turf coordinator provided 13 exhibits, 20 educational posters to town halls, libraries and stores, produced two articles for local and state newspapers, two classes (42 students) from the Three Rivers Community College and six turf workshops at demonstration sites.

b. Impact – Connecticut residents learned about the impact of lawn management (fertilizer use and turf species) on Connecticut's water resources and practices to protect water quality through proper turf management. Data collected from 27 of the 52 Master Gardeners participating in the turf training sessions reported a total of 135 changes resulting in improved lawn management practices. Changes reported include soil tests conducted, turf management practices reviewed, fertilizer applications reduced, grass clippings left on the lawn, fescues introduced into the lawn, white clover introduced into lawn to supply nitrogen and primary use of slow release fertilizers when fertilizers were used. 1,300 participants gained knowledge related to sustainable landscaping and 13 advanced Master Gardeners were trained in sustainable landscape techniques with a commitment that each volunteer would give 40 hours of service.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Pesticide Safety Education Program (PSEP)**

a. Activity – The objective of this program was to provide information and education about the safe use and handling of pesticides. Pesticides are poisons and as such they pose a potential threat to human health and the environment. The Pesticide Safety Education Program focused on the safe use and handling of pesticides and provided information about pesticides and their uses. The Federal Insecticide Fungicide and Rodenticide Act (FIFRA) directs the EPA to cooperate with the USDA and use the services of the Cooperative Extension System to inform and educate pesticide users about the accepted uses and other regulations made under the Act. The State of Connecticut requires that individuals using restricted-use pesticides on their own property or property which they rent for agricultural purposes become certified as private pesticide applicators. There are 750 private applicators certificates issued in Connecticut and 2,625 commercial certificates. The PSEP offered a formal short course to educate prospective applicants for certification in these categories. Other formal and informal programs about

pesticide safety were presented to specific commodity/grower, green industry groups, Master Gardeners, and other groups.

b. Impact – 127 individuals participated in the Ornamental and Turf Short Course at the three locations. Seventy-six individuals (21%) passed the state written exam. The Connecticut DEP administered 219 certification exams for Ornamentals and Turf and Golf Course Superintendents this year; of these, 48 passed (22%).

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

### **Key theme – Sustainable Greenhouse Program**

a. Activity – In Connecticut, the greenhouse industry is a significant part of the agricultural industry. Over 280 wholesale commercial greenhouse growers produce greenhouse crops in the state with a wholesale value of over \$90 million. Customers have a very low tolerance for any evidence of insect pests or diseases. Because of this, growers must produce a very high quality, pest-free crop. 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. To address this need an extension outreach sustainable greenhouse program targeted the 600 wholesale and retail greenhouse growers across Connecticut. Multi-state regional efforts also targeted growers throughout New England. To address this need, ‘Updates for Greenhouse Growers’ on emerging insects, diseases and cultural issues were placed on the Greenhouse IPM Web site at <http://www.hort.uconn.edu/ipm/ipmghse.htm>. Two new fact sheets were also posted on the web site related to Greenhouse IPM and 5 fact sheets were updated and revised. To address the need for up-to-date pesticide recommendations for vegetable bedding plants, the publication Management for Vegetable Bedding Plants was co-written (with T. Smith, University of Massachusetts) for the 2006-2007 New England Vegetable Management Guide. The 12-page publication, Pest Management for Herb Bedding Plants Grown in the Greenhouse published by the University of Connecticut Cooperative Extension System with cooperation from the University of Massachusetts Extension was revised and printed. Additional growers were reached via two articles in the national trade magazine, GrowerTalks, with a circulation of 8,000 readers. Additional growers were also reached by 2 crop updates that were published in the GMPPro, a national trade publication reaching 15,000 readers. Over 3,300 downloads of the Pest Management for Herb Bedding Plants Grown in the Greenhouse were made. Full season hands on training sessions were held at the individual grower greenhouses. Seven growers participated in the program directly impacting 2.3 acres of intensive greenhouse production with an estimated crop value (assume sales of \$12 per square foot) of approximately 1.16 million dollars. Over 65 site visits to greenhouse businesses were also made throughout the state where growers received direct diagnostic advice and walk-in consultations. Over 120 IPM visits were made to growers participating in the Greenhouse IPM program.

b. Impact – Based on a 71% return rate (68 of 95), 92% of surveyed growers attending a greenhouse program were able to identify two specific items of information that they learned and would use this upcoming production season including: how to better keep records as private applicators, submit media samples to the UConn soil testing laboratory that now uses the

saturated media extract (SME) testing for greenhouse growers, pH management, IPM controls, new insecticide products, and better use of biologically-based fungicides. Based on a 60% return rate (65 of 108), 45% used organic practices and 48% did not. 50% indicated that they learned information that they intended to use including: grafting, IPM and biological controls, cultural care, and energy saving techniques. Participants in the Greenhouse IPM program included family run and corporate businesses ranging in size from small 6,000 square feet greenhouse operations (i.e. mom and pop operations) to wholesale greenhouse businesses with 20,000 square feet of production. Participants included both spring seasonal businesses that grow bedding plants and garden mums to year-round producers of spring bedding plants, herbaceous perennials and poinsettias. Field training focused on monitoring for key insects, diseases, cultural and nutritional problems. Crop quality and pest management techniques were improved. All growers said they would recommend the program to other growers. All participants increased their adoption of IPM practices. For the 7 participating growers, insecticide use decreased, as 2.0 pounds of insecticide active ingredient was saved from application to 2.3 acres of production. In addition, crop losses were reduced and crop quality was improved. Whenever possible, growers selected more environmentally friendly products with shorter reentry levels, lessening worker exposure to pesticides.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - Multi-state

**Key theme – Solutions to the Invasive Ornamental Plant, Japanese Barberry**

a. Activity – Japanese barberry (*Berberis thunbergii*) is a popular landscape shrub that accounts for \$10 million in sales in Connecticut annually. It is ornamentally appealing and tolerant of a wide range of difficult landscape situations. Unfortunately, it also possesses invasive potential due to its fruit production. Research was conducted to determine if any extant cultivars are fruitless or present little invasive risk, determine if purple-leaved forms of barberry are invasive in shaded woodland conditions, develop sterile triploid forms through the use of mutagenic agents, and use DNA fingerprinting to determine the genetic origin of feral populations. Preliminary information was generated indicating that some barberry cultivars produce reduced amounts of fruit. These cultivars may represent plants that could be grown without presenting a significant invasive risk.

b. Impact –The nursery industry and regulatory agencies are awaiting the findings of this research to determine how to deal with Japanese barberry and winged euonymus, two potentially invasive species that are worth around \$10 million each year for CT growers and landscapers.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

**Key theme – Influence of Plant Morphology on Pea Aphid Predators**

a. Activity – There is a growing need to develop and implement integrated pest management (IPM) systems that depend on biologically based tactics. For instance, more than 500 insect pests, 270 weed species and 150 plant diseases have become resistant to one or more pesticides.

Moreover, concerns for human and environmental health and the cost of pesticide regulation stress the need for the switch to biointensive pest management systems. Such IPM systems rely on tactics such as host-plant resistance, biological control, and cultural controls. To contribute to the development of such IPM systems research seeks to understand tritrophic level interactions involving biological control agents. The predation efficacy of *Chrysoperla rufilabris* and *Coccinella septempunctata* larvae was evaluated on four pea near-isolines which exhibited normal leaves and stipules, afila leaves only, reduced stipules only, and both afila leaves and reduced stipules.

b. Impact – This research should contribute to understanding how plant traits influence biological control agents. The increased understanding of the interaction between plants and insect predators will assist in determining better release rates of a given natural enemy or even seek modifications to plant structures that could enhance natural enemy effectiveness.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

### **Key theme – Reduced-Risk Insect Control in Sweet Corn**

a. Activity – The Vegetable Crops IPM Training Program advocates the adoption of pest management methods that are economically, environmentally and socially sound. Growers learn to choose environmentally-friendly, selective pesticides, that are soft on beneficial organisms and that don't come with a lot of hidden costs. In Connecticut's sweet corn production, there is little use of older insecticides such as encapsulated parathion, carbofuran, chlopyrifos or even methomyl. Most growers rely on synthetic pyrethrums for insect control, which have far fewer detrimental characteristics compared with older materials, but still carry a fair amount of risk (i.e. to natural enemies and applicator health). The educational objective was to move some of the program participants away from relying solely on synthetic pyrethrums, and get them to try several of the newer, safer materials that are now on the market. Seven farms in Connecticut participated in the study.

b. Impact – Participating growers maintained sweet corn crop quality and yield through this IPM demonstration, but reduced risks associated with the use of insecticides by switching to new safer materials. Prior to treatment, 36% of the control block plants and 37% of the treatment block plants were infested with ECB caterpillars. At harvest, all growers reported perfect pest control (0% infestation) with the new insecticides, while all but one grower had similar results with their standard chemical. The 7 CT growers applied a total of 17 separate applications of SpinTor and Avaunt on 23.5 acres of sweet corn where they would normally have applied harsher products. All the growers thought that the new reduced-risk insecticides did a great job and said they would (71%) or might use it again (29%).

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - Multi-state

**Key theme – Biological Control for the Invasive Plant Purple Loosestrife**

a. Activity – Invasive non-native plants such as purple loosestrife (*Lythrum salicaria*) are a serious concern because they grow and establish quickly over wide areas and decrease the abundance of native species, reducing biological diversity in wetlands, meadows, forests, and other natural areas. Biological control, the use of natural enemies to reduce an invasive plant's population below a biological or economic threshold, is a sustainable, low-input method to control purple loosestrife. Four species of biological control agents have been introduced in Connecticut for control of purple loosestrife, with the *Galerucella* beetles reared and introduced in the greatest quantity. *Galerucella* leaf-feeding beetles are approved for biological control of purple loosestrife, and these beneficial insects have been introduced into Connecticut wetlands since 1996. 69 presentations, field demonstrations, and workshops on purple loosestrife and invasive plants were offered. Four Beetle Farmer workshops were attended by 110 people where they learned about instructions to raise and release the beneficial beetles.

b. Impact – As more Beetle Farmers are recruited and participate in the statewide purple loosestrife biological control program, the numbers of biological control agents available for control of this widespread invasive plant increases significantly. Since the initial releases of *Galerucella* beetles into Connecticut wetlands in 1996, more and more release sites are showing signs of purple loosestrife control and a return of native or non-invasive, non-native plants to the area. Through the transition of the wetland to an increased abundance of non-invasive plants and increased control of purple loosestrife, the *Galerucella* beetle population increases to the point that these sites can now be used as field insectaries where Beetle Farmers collect the beetles they need as starter colonies for their own plants. Beetle Farmers and purple loosestrife biological control are topics that have been recently been included in new IPM curriculum materials developed by area teachers.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - Multi-state

**Key theme – Sustainable Agriculture Vegetable Crops**

a. Activity –The Sustainable Agriculture Vegetable Crops Extension Program is designed to create and maintain a safe, secure and highly competitive agricultural system, while protecting natural resources and the environment for a healthy and well-nourished population. The program provides Connecticut and New England vegetable farmers with cutting-edge solutions to their pest management and crop production problems and to help keep them competitive on the local, regional and national level. Twenty Extension personnel throughout New England team up with grower volunteers, researchers, service industry representatives, granting agencies, the New England Vegetable & Berry Growers' Association, USDA, EPA, CT DEP and other local partners to help provide commercial vegetable producers around the state and region with Sustainable Agriculture education. Almost 1,300 people attended the three-day New England Vegetable and Fruit Conference & Trade Show in Manchester, NH. A record 159 growers, researchers and service representatives attended the Annual CT Vegetable and Small Fruit Growers' Conference in Vernon, CT. Over 90 producers attended the Greenhouse Tomato Conference held in Vernon, CT. The 2006-2007 New England Vegetable Management Guide was updated with new techniques and pesticide listings and almost 1,500 copies were sold

throughout the region and a web version is now available for the first time ([WWW.nevegetable.org](http://WWW.nevegetable.org)). The UConn vegetable telephone/internet pest message provides weekly reports on trap captures, disease occurrence, and management practices throughout the growing season and receives over 3,500 calls/hits per year. Almost a dozen proceedings, technical reports, Extension fact sheets and newsletter/web site articles were produced. The UConn IPM web site alone is accessed by over 450,000 people per year. A new newsletter for commercial vegetable and fruit growers ('Crop Talk') reaches 840 growers on a quarterly basis.

b. Impact – Evaluations were conducted on major conferences, participatory research programs and for the full-season Vegetable Crops IPM training program. A total of 160 people returned evaluations of the New England Vegetable and Fruit Conference and Trade Show. Over 94% rated the educational sessions as excellent or good, 91% of the respondents said their pest management would improve, 89% said their cultural practices would improve, 85% said their soil and nutrient management would improve, and 79% said their farm profitability would improve as a result of the conference. A total of 89% of the respondents said they found a new source of information at the conference and 78% said they planned to implement new practices after attending. A total of 63 growers returned evaluations of the Annual CT Vegetable and Small Fruit Conference. All (100%) of the respondents rated the educational program as excellent or good, 98% said that it would result in improvements in their crop production and marketing practices, 97% said it would improve their pest management and/or crop quality, 87% said it would improve their farms' environmental quality, 75% said it would improve their farm profitability, and 63% said they would adopt new practices as a result of attending the conference. Of the 17 full-season IPM field training and USDA NRCS EQIP program participants, 13 participated in the sweet corn IPM program. These 13 growers reduced the amount of active ingredient they used on 303 acres of sweet corn by 1.3 pounds of A.I./acre or 31%. They increased their sweet corn yields by 12% and saved \$141,208 (\$466/acre) by reducing pest damage.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - New England

### **Key theme – Integrated Pest Management (IPM) Curriculum**

a. Activity – The Connecticut Curriculum for Integrated Pest Management is a science-based curriculum that teaches the concepts and methods of IPM to school children and 4-H youth. During this fifth year of the six-year project, the IPM curriculum for second and third grade students was published. Workshops were presented to teachers at professional conferences, Regional Education Service Centers statewide, and the National Science Teachers Association (NSTA) Eastern Area Convention. The curriculum teaches concepts and methods of IPM that include an introduction to IPM, what pests are (insects, weeds, and diseases), how to control pests (mechanical, biological, chemical, and cultural controls), and how to protect the environment by keeping food and water safe to eat and drink and preserving biological diversity. The grade 2/3 curriculum includes 6 units, 21 lessons, and supplemental activities that consist of lesson plans, books, picture cards, and Izzy the Praying Mantis puppet, videos, an activity book, games, and performance assessments. One hundred and fifty full curriculum kits were printed. The curriculum units were developed to be included in science programs, but they also contain

strands that link the subject areas to social studies, language arts, math, and art. The IPM Curriculum is broad-based in terms of pests and crops that are addressed. It engages students, their families, and other citizens in learning about pests, including insects, rodents, weeds and invasive plants, and diseases that are potential threats to plants, humans, and other animals in and around homes, public buildings, agricultural lands, and natural areas. The curriculum also provided information on beneficial organisms, such as lady beetles.

b. Impact –The curriculum has received an overwhelmingly positive response, from Connecticut teachers, 4-H program leaders, and also from regional IPM leaders. To date, IPM curriculum kits, which include lesson plans, assessments, and supplemental materials, have been disseminated to 110 schools in Connecticut, with some schools receiving more than one curriculum for different grade levels. Approximately 150 educators and other professionals have received training, primarily in Connecticut and a small number in the Northeastern Region. As educators and IPM Extension staff learn about the new IPM curriculum, the demand for this information is growing, requiring a search for supplemental funding to print additional curriculum kits and provide training sessions in the state and the region. A key component of the IPM curriculum is that the majority of the revised Connecticut Science Standards are covered in the lessons, which will increase the likelihood that educators will find time in their busy teaching schedules to not only pilot the lessons with their class but make the IPM curriculum an integral part of what their students are taught.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

### **Key theme – Biological Control of Scarab Beetles in Turf**

a. Activity – Turfgrass in the Northeast is attacked by several insect pests which feed on the root systems and on above ground plant parts. The most damaging pests of turf are the immature stages of the scarab beetles or white grubs. Conventional insecticides continue to be the major tool to manage these turfgrass pests in sod production areas, recreational and private settings. However, distress about the use of pesticides in urban areas, particularly where children are likely to come into contact with pesticide materials has energized the demand for pest management programs that rely less on chemical insecticides. An example of such public concern is Connecticut's Public Act 99-165 which requires notification to parents when a pesticide application will occur in the school buildings or grounds. Turf is an important part of the community landscape and the agricultural sector. The advancement of turf integrated pest management (IPM) is as important as IPM of other managed systems. For instance, a report by the National Academy of Sciences indicated that homeowners tend to use as much as ten times more chemicals per acre on their lawns than farmers use on agricultural land. Research was conducted to advance the use of biologically-based alternatives that will be easy to implement by sod-producers, managers and homeowners.

b. Impact – Results support further examination of the use of *Metarhizium anisopliae* in a granular formula coupled with turfgrass aeration at the time of application. Research on the efficacy of *M.anisopliae* will contribute to the development of a biopesticide tool against white grubs. Results indicated that the granular formulation of entomopathogen was the most effective

in reducing the number of larvae as compared to the liquid formulation. This treatment exhibited a 49% reduction in grub survival as compared to the control plots.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

## Goal 5 – Enhanced Economic Opportunity and Quality of Life for Americans

The Connecticut program was active and successful in this area with a wide variety of efforts conducted during the reporting period.

Extension programs in family resource management focused on issues related to increased debt and personal bankruptcies. Educational programs reached numerous audiences, including single females and low-income individuals. Increased money management skills resulted, according to survey responses.

As a result of participating in the Managing Your Money Series, 91% of social service agency staff indicated, on post-program surveys, that they would share information with their co-workers and 40% planned to present a money management program at their agency.

Parenting education programs were designed to enhance healthy family functioning through positive parent-child interactions, communications and discipline techniques. A Parenting People program series in Danbury found 80% of parents demonstrated improved parenting skill and 100% reported they were using or planning to use new skills as a result of the program.

Another program highlight included a program for 4-H youth that offered youth leadership/philanthropic programs designed to raise and distribute funds. Youth United students raised \$1,800 dollars and awarded two grants of \$750 that focused on conducting drug free activities in the Danbury area.

*How Mother Bear Taught the Children about Lead*, a lead-poisoning prevention curriculum for Native American children, has been added to the National Institute for Environmental Health Sciences (part of NIH) website and is expected to be printed and distributed nationally by the CDC.

Benefits to clientele and stakeholders who participated in this goal area were many; including improved family relationships, improved skills by youth entering the workforce, better actions by individuals and families to manage financial matter and enhanced parenting techniques.

In summary, the assessment of accomplishments is considerable, and is measurable in terms of the previously submitted 5-year Plan of Work. Total expenditures, by source of funding, and full-time equivalents for this goal are:

Goal 5		
Funding Source	Expenditures	FTEs
Smith-Lever	732,614	11.13
Hatch	6,255	0.12
Multi-state research	5,914	0.11
State funds	2,028,529	27.14
Competitive grants	156,188	3.55
Animal health	-	-
Total	2,929,500	42.05

**Key theme – Income Tax School**

a. Activity – The focus of the Tax School is to provide tax information to tax practitioners in the State of Connecticut. This tax school is a cooperative effort between the Department of Agricultural and Resource Economics, and the Connecticut Department of Revenue Services, the U. S. Internal Revenue Service, and private sector tax accountants and attorneys within the state. The output of the project is a two day tax school providing 16 continuing education credits for tax practitioners in Connecticut to 211 tax practitioners most from smaller practices within the state.

b. Impact – The impact of the tax school is the provision of up-to-date, accurate and timely tax information to assist smaller tax practitioners and their clients throughout Connecticut. Tax training for practitioners translates into more efficient and accurate tax payments for clients.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Financial Literacy and Consumer Education**

a. Activity – Connecticut ranks number one nationally in per capita income, with the gap between its highest and lowest income families increasing faster than most other states. Twenty-five percent of Connecticut's children live in low-income families. Sixty-four percent of low-income families live in single-parent households. Connecticut ranks 28<sup>th</sup> in income inequality in the nation. Families seeking financial assistance and counseling from social service agencies continues to be in high demand as they try to cope with Connecticut's economic climate. The target audiences for whom these programs were provided are limited resource families and individuals enrolled in programs sponsored by agencies working with at-risk families. The objectives are to provide program participants with the skills necessary to manage their money and to give parents the skills necessary to teach their children about managing money. Train-the-trainer programs were conducted for staff representing 14 statewide agencies. Your Money program series were conducted as part of the Communication of Parent Effectiveness Skills program (COPES) at the Danbury Regional Child Advocacy Center.

b. Impact – Social service agency staff in post-program evaluations reported that they felt more confident advising clients about money management. Evaluations also indicated that: 100% planned to use the skills learned in their work; 90% will distribute one or more worksheets to their clientele; 91% will share workshop information with their co-workers; and 40% planned to present a money management program at their agency. Agency staff indicated that they have changed their own personal practices, improving their money management skills after participating in the training. Using Hurricane Katrina as the “teachable moment”, news releases on the topics of charity fraud and household recordkeeping and documentation were written and distributed to print, broadcast, and electronic media statewide resulting in these articles being posted on websites maintained by UConn and CT's broadcast stations. EDEN also posted these articles and they were translated into Spanish by the University of California for national distribution. Limited-income consumers who are “unbanked” have begun to feel more confident about using banks and taking advantage of the many services that financial institutions offer them.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Financial Literacy for Youth**

a. Activity –The Connecticut Jump\$tart Coalition for Youth Financial Literacy was formed this year to bring together educators, state officials, the business community and nonprofits to focus attention and resources on helping advance young people’s understanding about saving, investing and spending money responsibly. According to Connecticut State Treasurer Denise L. Nappier, “A solid grounding in financial matters has become a prerequisite for success, and our goal must be for every child to acquire the financial savvy that their future will demand. The current level of financial literacy among our youth is unacceptable, and this data is a call to action for Connecticut, for community and corporate leaders, educators and parents.”

Connecticut Jump\$tart Coalition released the results of a recent Jump\$tart survey. It showed that Connecticut high school students answered roughly half of the national survey questions correctly on the basics of personal finance. The average score of 51.2% among Connecticut students surveyed was about one point below the national average. The most recent survey of the state’s high schools show 57% offered semester or half semester classes on personal finance to their students. Cooperative Extension in Connecticut has a long history of working to increase the financial knowledge of youth and also training teachers, leaders and other adults to teach teens and youth financial and decision-making skills. With greater attention focused on financial literacy for youth in Connecticut, there will be more opportunity to utilize Extension expertise in this area. “Welcome to the Real World: Connecticut Edition” was piloted at the Personal Finance Symposium with 36 teachers attending.

b. Impact – Brief evaluation surveys at the end of the sessions indicated that 86% (33 out of 38) of the participants gained at least two new ideas they planned to incorporate in their classrooms or in individual sessions with their clients. They also appreciated the opportunity to participate in demonstrations of experiential activities for their learners.

Connecticut teachers and professionals learned how to teach students the financial facts of life.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Identity Theft**

a. Activity – The Federal Trade Commission (FTC) reports that annually close to 10 million American’s are becoming victims of identity theft. The latest FTC data reports that Connecticut is ranked 23<sup>rd</sup> in the nation for victims of identity theft in FY 2005. The train-the-trainer program *Preventing Identity Theft* addresses these issues. The objectives of this program are to provide participants with the skills necessary to teach their clientele/students about avoiding identity fraud and what they should do if they are victimized. The program materials included a training manual, teaching and resource guides and the fact sheets: Strategies for Protecting Your Privacy; Identity Theft: What to Do If You Become a Victim; Protect Yourself from Identity Theft; and Protect Your Privacy. Participants are encouraged to reproduce these and distribute them to

clientele and to also include them in their newsletters. Train-the-trainer workshops were conducted for 90 program participants, including social service agency staff and volunteers who work with senior citizen; housing authority personnel assisted living facility staff, and municipal employees, teachers, law enforcement professionals, and health care professionals. Workshops also were conducted for 450 adult participants of the following: senior groups, parenting programs, grandparents raising grandchildren programs, and social service agency coalitions.

b. Impact –Post-program surveys indicated that 89% increased their knowledge related to consumer privacy rights, and 93% increased their knowledge about ways to minimize the risks of identity theft. Twenty-five percent plan to conduct identity theft prevention programs for their clientele/students, 75% will reprint fact sheets in their agency newsletters, and 61% indicated that they intend to share the information with professionals at other agencies. Educators attending the Connecticut State Department of Education Teaching Personal Finance conference participated in post program surveys workshops and indicated that as a result of this training they planned to change the way they disposed of personal identifying information; teach their children/family members about protecting personal information; protect their personal information by questioning the collection and use by those who request such information; and place their names on opt-out lists and no-call lists for telemarketers.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

### **Key theme – Parenting Apart**

a. Activity – With one out of two marriages ending in divorce, Family Courts have implemented court-connected educational programs for parents who are divorcing. Connecticut was the first state to legislate mandatory programs of parent education for all couples with minor age children for a legal separation or divorce. When children receive support and validation from caring adults they can recover more successfully from the trauma of divorce. The objectives of the educational program are to provide a quality parenting apart educational program for parents going through divorce and to provide parents with the skills to work cooperatively in parenting their children in divorce situations.

b. Impact – 164 parents participated in the court ordered program in this time period. Findings from the State program evaluations in the past indicate that 80% of parents improved their parenting skills through participation in 6 hours of court ordered parenting classes.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

### **Key theme – Family Functioning/Parent Education**

a. Activity – Parenting People is a parent education curriculum developed by Cooperative Extension for use by community agencies and organizations. It is being adapted by 17 states. In

the Danbury area, a coalition of family serving agencies identified ParentNet as the coordinator and provider of ongoing parent education. ParentNet determined to use Parenting People because it is comprehensive, research-based, flexible and easy to use. During this time period, eight 10-week sessions were conducted. Eighty parents participated and received certificates of completion for their participation. Approximately 50% of parents were referred by the Department of Children and Families. Classes were conducted in English, Spanish and Portuguese to reflect the diversity of this population.

b. Impact – According to program evaluations and informal feedback from agency staff working with these parents: 80% of parents demonstrated improved parenting skills as reported by family caseworker; 90% of the respondents reported that their parenting skills improved substantially as a result of attending the programs; and 100% of the respondents reported that they were using or planning to use new skills as a result of attending the program. Skills included: positive communication, moderate discipline, consistent rules, age appropriate expectations, and self care. Additionally, a Parenting People program series has been provided in Bridgeport for the Adult Education Center. Sixteen mothers or fathers completed the series. According to program evaluations, 85% reported that they had learned skills to parent in a more moderate manner, 100% reported that they learned new ways to manage their stress, 90% reported that they learned that it was important to take care of their own personal needs so that they could be a better parent, 100% reported that they learned the importance of and how to develop routines and rules for their children, and 90% reported that they learned and would be using new skills to discipline their children.

c. Source of Federal Funds – Smith Lever b/c

d. Scope of Impact - State

### **Key theme – Epiphany: Mentoring for Ex-offenders**

a. Activity – The Department of Corrections collaborates with the courts, law enforcement, social service agencies, non profits and faith based communities to provide services in and out of prison. These programs have all had varying degrees of success at reducing the rate of re-incarceration. Two out of three offenders will return to prison within three years. One effort that has had a lower rate of re-incarceration is the New Life Prison Ministry, Old Lyme. In eight years, New Life, a faith based mentoring program, has worked with over 80 inmates with an 85% success rate. CES educators and a prison volunteer decided to build on the success of New Life and organized a design team. The program is designed to reduce the rate of re-incarceration among offenders by creating a network of support to help individuals build successful lives in society. Its' four major goals include: creating a pilot project, developing a how-to manual, conducting a conference for faith based communities interested in joining the Epiphany network and providing support for faith communities involved with the project. Training included a panel from the New Life Prison Ministry, a retired DOC volunteer, ex-offenders from a group home, and community service professionals.

b. Impact – Two of the mentors and one of the resource team members reported that they have gained knowledge about the types of services available to ex-offenders. One learned more people skills such as how to size up a person, how to say things in a less offensive way, etc. Another

person learned more about the types of crimes that bring offenders to prison. Nationally there is a great deal of interest in programs that promote successful re-entry- particularly faith based mentoring. The CES Educator was the only CT presenter at the national American Correction Association Conference in Nashville, TN. It can be estimated there is a savings of approximately \$17,057.24 to the State of Connecticut for not re-incarcerating an offender.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – People Empowering People Program (PEP)**

a. Activity – The need to help families with limited financial resources is not new. In the past, educators and others worked at fixing what was wrong with poor families. Within the last decade, the trend has been away from viewing poor families as having weaknesses or deficits toward helping them to see their strengths. Today, educators and other helping professionals engage in a partnership with individuals as they set their own goals. The People Empowering People (PEP) program embodies this empowerment model of looking at individual and family strengths. PEP is an innovative program designed to build upon strengths of adults and older adolescents with limited financial resources. PEP recognizes the unique strengths, life experiences and capacities of each person and emphasizes the connection between individual and community action. Individual change is encouraged through 10 two-hour training sessions and bi-monthly or weekly followup sessions. Participants work on one or more projects that benefit the community. Generally, they commit four-eight months to the program. Trained facilitators from collaborating organizations praise PEP's adaptability to a wide range of audiences: incarcerated men and women, teen mothers, family resource center parents, Hispanic adults, and adults from community based organizations. Facilitators conducted the PEP program with approximately 192 participants at family resource centers in Bristol, Bloomfield, Branford, Plymouth, Stafford, West Hartford, Windsor; community agencies in East Hartford, Wallingford, Danbury; and the Enfield, Cheshire and York Correctional Institutes.

b. Impact – Based on pre and post surveys, 16 participants were able to express their opinions when others disagreed; felt accepted and supported in the program and felt like they were part of the community. Two groups wrote motivational essays to young people. The facilitator recorded the men giving speeches based on the essays. The recording was then played to adolescent boys at the Cromwell Children's Center. The boys made a lot of affirming comments about the video. PEP participants donated approximately 860 hours for project work worth approximately \$18,662. Out-of-state outcomes include Holyoke Health Center and collaborators in Holyoke, Mass seeing seven Hispanic women graduate from PEP, with two having part-time jobs, three having full time jobs and one hired by a social service agency.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

### **Key theme – Healthy Environments for Children (HEC)**

a. Activity – It is now widely accepted that children have special vulnerabilities to environmental exposures. It is also widely understood that our nation has a responsibility to protect the health and well being of its children. While much remains to be learned, research has already demonstrated clear issues that can and must be addressed immediately. The Healthy Environments for Children (HEC) Initiative is helping to tackle some of the well-understood issue such as lead poisoning and radon, and is addressing emerging issues—such as the environmental aspects of asthma. In the case of lead poisoning, the nation, the state and indeed HEC is working toward the national goal of eliminating childhood lead poisoning by 2010. In the case of radon, HEC is working to train home inspectors on how to correctly test for radon, a know cause of lung cancer. Working in partnership with federal, state, local, and private agencies and organizations, HEC supports interventions that can be implemented at home, at school, and in other community settings. HEC has developed a strong regional reputations resulting in a large number of partnerships and collaborations, including **the Center for Disease Control and Prevention (CDC) to co-sponsor the Childhood Lead Poisoning Prevention 2010 and Beyond**, Maine Department of Environmental Protection, represented NELCC at meetings, semiannual CT DPH lead meetings, lead roundtable at state legislative office, Lead Safe New England 2010 meeting in Boston, CT Lead Task Force; maintain communication with EPA, Region 1 and wrote comments on lead issues to Consumer Reports and the Hartford Courant. The Lead-safe Painting, Remodeling and Maintenance statewide trainer and worker database of course participants for this training course. To date, 1700 have taken this course. An IRB approved survey of these participants is underway. This year 3 new individuals were trained and approved as trainers for this course. **The video *Don't Spread Lead: A do-it-yourselfer's guide to preventing lead poisoning by working lead-safe* featured a guest appearance by Norm Abram master carpenter on PBS' This Old House and host of The New Yankee Workshop. Keep It Clean is online lead poisoning prevention training for employees of home improvement stores developed this year. It is available at <http://www.nelcc.uconn.edu/kicc.html>. [www.hec.uconn.edu](http://www.hec.uconn.edu) is the completed website for Healthy Environments for Children and features all of the educational materials. [www.nelcc.uconn.edu](http://www.nelcc.uconn.edu) is the completed website for the New England Lead Coordinating Committee administered by HEC and features links to educational programs and joint projects.** Met with CT Foundation for Educational Advancement and state Department of Education and helped to design lead training for pupil support personnel and served as a panelist at this statewide training for educators, pupil support personnel and administrators entitled “The Educational Implications of Childhood Lead Poisoning. The panel featured the internationally known Dr. Herbert Needleman, responsible for bringing about the ban on lead-based paint in the United States and whose studies confirmed the fact that exposure to lead cause can permanent developmental and behavioral damage to children. HEC co-sponsored this

training with the CT Commission on Children, the CT Dept. of Education, the CT Dept. of Public Health, the CT Health Foundation, and the Foundation for Educational Advancement and the State Education Resource Center. Wrote the video script for an animated version of the previously produced children's curriculum *How Mother Bear taught the children about lead*. This is being developed for the Penobscot Indian Nation and the Houlton Band of Maliseets, in cooperation with Stock's Eye Productions. Appeared on the WVIT, Channel 30 TV program What About Women with a colleague from the CT Department of Public Health. The program topic was Creating Healthy Environment for Children. Designed and completed development of radon measurement training for CT DPH.

b. Impact – The CDC National Lead Training Center has been showing the HEC "Volunteers Opening Doors: The Five keys to Lead Safety" video as part of its Primary Prevention training track since 2005. Approximately 150 participants including CDC grantees who are state and local staff of CLPPP (Childhood Lead Poisoning Prevention Programs) have attended the training. After learning about HEC's children's lead poisoning curriculum online, EPA Region 2 in Philadelphia, PA asked for permission to reprint and distribute through the government printing office, "The Adventures of the Lead Busters Club" in English and Spanish and "How Mother Bear Taught the Children About Lead" co-produced with the Penobscot Indian Nation. When members of the Seneca Indian Nation saw the HEC "How Mother Bear Taught the Children About Lead," they met with HEC program personnel to discuss developing a similar children's curriculum on water conservation. They are also seeking funding for HEC to adapt existing materials for the Seneca children. CDC is seeking to print and distribute nationally our children's read-aloud bilingual book "Henry and Fred Learn About Lead".

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - Multi-state

**Key theme – Building Family Futures: A Parenting Education Train-the-Trainer Program**

a. Activity – Building Family Futures is a training program that prepares managers and staff of outpatient, day treatment, and residential programs to provide parenting education to their clients in both individual and group settings. This training is based on the National Extension Parenting Education Model (NEPEM), a research-based, nationally tested framework that identifies critical parenting practices associated with healthy outcomes for children. The NEPEM goal of parenting education is to strengthen and educate parents so that they can facilitate children's development. DHMAS funded a "graduate" program for those who completed the Building Family Futures training. There are 8 professionals participating in the Alumni Academy. The co-facilitators developed the "Practice Demonstration Guide" for alumni participants. This guide provided a framework for the participants to enhance their mastery of the materials from the Building Family Futures (BFF) curriculum through practice demonstrations and collegial critiques.

b. Impact – Program staff members and managers who successfully completed the Building Family Futures training program were able to recognize the significance of the relationship between parenting approaches and outcomes for children, define critical stages of child development, describe effective parenting practices associated with each stage of development, associate parenting styles with outcomes for children, explain effective parenting strategies,

including parent-child communication methods and discipline techniques, describe practical parenting skills, such as self-care, family nutrition, financial management, and finding and maintaining safe housing, and employ effective training techniques to teach clients how to build constructive parent-child relationships and how to apply practical family-life skills. Alumni participants have conducted practice demonstrations on the following topics from the BFF curriculum: Utilizing training skills to facilitate successful home visits with clients, teaching children to solve problems, school-age development, helping children to succeed in school, parenting styles, and managing stress.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – 4-H Youth Development/Communication and Expressive Arts**

a. Activity – Data suggests that healthy and productive citizens need to be skillful in interpersonal communication skills and confident in his/her ability to express themselves with people from diverse and divergent backgrounds. 4-H offers skill building workshops and programs in public speaking. Opportunities are provided for youth to demonstrate and enhance their public speaking skills. Youth generally attend public speaking workshops that focus on content organization and delivery. In addition to the annual Public Speaking Program, youth practice their public speaking skills as opportunities arise – speaking about their 4-H project on the radio, on cable TV, to local groups, as commentators for various 4-H events, and as oral reasons in the horse judging program.

b. Impact – 102 youth increased their skills in public speaking (material organization and delivery). Public speaking skills were demonstrated by 73 youth conducting a demonstration, illustrated talk, or speech during the public speaking contest, 10 delivered oral reasons for horse judging placements at the State contest, 13 served as commentators at various 4-H activities, and six were selected for the county Public Speaking Honor Group. Additionally, a committee of teens and adult volunteers developed a County 4-H web page (<http://www.fairfieldcounty4h.org>) that provided information to prospective leaders and members and information to current members and leaders.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – 4-H Youth Development/Leadership Education**

a. Activity – Involvement in a program of Leadership Education fosters important skills, knowledge and confidence required of all effective leaders. Being an educated and experienced leader will help youth make the best decisions for themselves and others and will prepare them for the adult roles they will assume in the home, community, workplace, state, and nation. Leadership education for adults prepares them to be effective role models for youth. Good leaders must have good character. Training in all areas of youth development, youth leadership

education and program management is provided to adult volunteers and teens for incorporation within their on-going groups. Training is done on an annual basis and as the need arises.

b. Impact – Over 27 4-H teens were nominated as Outstanding High School Students. Volunteers trained and supported by County 4-H staff donated at least 1500 hours of time, valued at some \$33,075 in providing positive youth development programs to CT's youth.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

### **Key theme – 4-H Youth Development - Leadership Education/Youth United**

a. Activity – The concept of youth philanthropy is a growing movement dedicated to providing youth with a voice and a role in devising and carrying out important social initiatives. Teens can and want to make a difference in their communities. Providing this opportunity for teens fosters important skills, knowledge, and the confidence to be effective leaders and productive adults. The skills learned in an experiential and teen-relevant leadership education program also provides an arena for teens to learn and practice important work skills. Youth United is a new youth leadership/philanthropic program in Danbury CT that is a collaborative effort between Fairfield County 4-H and the Housatonic Valley Coalition Against Substance Abuse (HVCASA) that empowers teens to make a difference in their lives and in their community. In Youth United, teens develop a Request for Proposal focusing on drug prevention. They promoted and publicized this grant opportunity, selected grant recipients, monitored and visited “grantees”, reviewed reports and collated data and then reported back to the community on the impact of their grants.

b. Impact – Youth participated in 60 hours of class work and field trips. Through fundraising efforts, \$2,000 was raised for youth to disperse. Approximately \$1,800 of in-kind support was received from the community. Youth United teens awarded two grants of \$750 each. These grants focused on conducting drug free activities involving over 233 youths. 80% of Youth United teens reported an increase in knowledge of the harmful effects of alcohol, tobacco and drug use, 50% of Youth United teens reported a decrease in risky behaviors associated with Alcohol, Tobacco and Drug use, and 80% of Youth United teens reported an increase a positive sense of contributing to the community. By working in teams with an adult facilitator, teens learned valuable skills that are important in a school setting, as well as critical to success in the workplace. Youth learned life skills such as reading, public speaking, leadership, personal responsibility, decision making, goal setting, attendance, teamwork, creative problem solving, critical thinking, group process, accessing community resources, and the importance of volunteering. Effective methods of program planning, problem analysis, proposal development, fundraising, community organizing and evaluation, need assessments, and effective drug prevention practices are also learned in this “hands-on” experiential format.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

### **Key theme – Extension - 4-H Youth Development/Citizenship Education**

a. Activity – Involvement in an informal program of citizenship education provides youth with challenges, experiences, support and help which foster a positive attitude toward current and future citizen and community responsibilities. CES developed a process, standards and opportunities in which youth and leaders recognize the value and importance of community service.

b. Impact – 32 youth and two 4-H groups received recognition for their 11 community service projects. Over 830 hours were contributed by local 4-Hers to better their communities. \$150 4-H community service mini-grant was awarded to a 4-Her for her work with the ALS Association. During Fairfield County's community service project that takes place in our Fallback into 4-H Festival, over 150 emergency toiletry packets (shampoo, rinse, comb, toothbrush, toothpaste, and lotion) were assembled and donated to the Danbury Domestic Abuse Crisis Center. 4-Hers solicited toiletry packet supplies from local stores and dentists.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – 4-H Youth Development/Workforce Preparation**

a. Activity – 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. CES/4-H works to integrate workforce preparation skills into existing programs and activities. Summer Youth employment programs offer a valuable opportunity for workforce training. The marketing and distribution of the "R.I.S.E. (Respect and Integrity through Skills and Education): A Workforce Readiness Program for Youth" is a focus.

b. Impact – R.I.S.E. has been in the National 4-H curriculum collection since 2001. The R.I.S.E. manual (Respect and Integrity through Skills and Education) A Workforce Readiness Program for Middle School Youth" - was chosen as a lead curriculum for the NFLCharities/JCPenny National Afterschool 4-H workforce grant program. The R.I.S.E. manual continues to be distributed nationally, with over 152 sold this year. During this reporting period, 10 states instituted over 30 R.I.S.E. programs involving over 4,000 youths.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – 4-H Youth Development/4-H Club and Teen Leadership**

a. Activity – 4-H club work is the foundation of the University of Connecticut's 4-H Youth Development Program. Involvement in an informal educational program, with a variety of subjects, provides youth with challenges, experiences, support and help which foster a positive attitude towards their future. The 4-H Club experience provides them with coping skills to be successful in today's world.

b. Impact – Leadership skills learned and practiced by 15 teens have helped them to plan, organize and run the Litchfield County 4-H Fair, and increased their abilities to work in leadership roles in their local 4-H clubs. Seven teens took the initiative to apply for state 4-H awards, based on their leadership experiences. This is an increase over previous years. As a result, the seven earned state recognition as representatives to the Citizenship Washington Focus Program. Teens value their 4-H leadership experiences and credit the program with giving them skills they could not learn elsewhere.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – 4-H Youth Development Program/Science, Engineering and Technology**

a. Activity – National 4-H is clear in their directive to have 4-H clubs and members promote the use of science, engineering and technology in their club work. The Hartford County TechTeam focused on computers, web pages, technology, GIS-GPS technology and collaborated with Dr. Arnold Goldman, head of the Connecticut State Animal Response Team to work on a project that allowed the 4-H members to learn and practice practical uses of the GIS-GPS technology.

b. Impact – The Hartford County TechTeam worked on the Hartford County 4-H website, which is close to being completed. The website, designed by members of the team, will be managed and updated by them throughout the year, with input from the county 4-H program specialist. This will also be an additional site for the general public to visit and to learn more about the Connecticut 4-H program. It will be linked to the Connecticut 4-H website, 4-H camp websites, the websites for the College and University, and more. In their partnership with Dr. Goldman and the Connecticut SART program, the members of the TechTeam used GIS/GPS units to map potential sites where Connecticut animals can be housed in an emergency, such as Hurricane Katrina. This would include both domestic and farm animals. Teens learned to identify potential sites, speak with landowners about possibly housing animals, use the GIS-GPS units to collect data, and download this information into a computer. They created a map of potential sites to house animals which will be used by CT SART. One former member of the TechTeam is currently a junior in college, studying Information Systems Engineering, and is a registered 4-H volunteer leader working with the team when home.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – 4-H Positive Youth Development, 4-H LIFT Afterschool Program**

a. Activity – 4-H LIFT (Learning, Interaction, Friends, and Talents) is an afterschool program serving students in grades 5-8 who attend Windham Middle School, Willimantic, CT. 4-H LIFT students work with college students with whom they can identify. They are great role models and provide incentives for students to do well in school, stay off drugs and attend college. LIFT enrolled 115 students, about 10% of the total school population

b. Impact – 4-H LIFT students continue to have better school attendance, higher grades, and positive social interactions than their peers.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Connecticut Framework and Math Common Core**

a. Activity – The 4-H Education Center at Auer Farm is located in Bloomfield Connecticut, 8 miles from the center of Hartford. The purpose of the 120 acre facility is to provide quality educational experiences to youth and outreach programs to adults and family members. Participants come from throughout the state but are predominately from the Greater Hartford area. The Connecticut Department of Education has developed a framework for science curriculum for pre-K through high school, with the expectation that all school children pass a State Mastery Test in science in grades 4 and 6 in 2008. There is also a state common core curriculum for math and a state math mastery test that is administered to school children. Children can not participate in programs either during school hours or out of school time that does not meet learning objectives that prepare them for the mandated mastery tests. The 4-H Education Center provides seasonal and year round science and math lessons both at the Center and off the Center grounds at schools and community based program sites. The different educational lessons correspondingly meet the objectives taught by grade level as prescribed in the Science Framework and when appropriate, combine lessons that have their base in the Common Core for math.

b. Impact – The Center's education programs were presented to over 18,000 children and teachers in grades pre-K through high school during this impact period. Programs selected by the Hartford and Bloomfield school systems fully corresponded to the Connecticut Framework and Common Core. 20% of the participating school population comes from Hartford Schools, whose students have consistently scored amongst the poorest performing in the state. The town of Bloomfield has budgeted visits to the 4-H Center in their Education Budget. The Science Curriculum people worked with Auer Farm personnel to match Auer Farm curriculum to their grade level science kits, with 80 school classes attending academic year lessons in science and math.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

**Key theme – Camp Resource**

a. Activity – 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. Many young adults of college age have the enthusiasm and desire to work with youth. When they receive experientially based training to develop an understanding of the needs of youth and skills to create programs which meet their needs, they most often develop into wonderful camp counselors. 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. CES is an educational resource for Connecticut 4-H camps as well as others in the camping industry.

b. Impact – A group of 20 representatives from all four 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. 3717 youth attended a CT 4-H resident camp for at least a week last summer. An extensive survey was conducted with parents and campers. It was reported by 97.4% of camper parents that their child's camp experience was excellent or good. A large percentage of parents stated that camp had a positive impact on their child's life. More specifically, 55.2 % felt that camp has had an impact on their child or teen's ability to make new friends, 49.1% felt that camp has had an impact on increasing self confidence, 50.0% felt that camp has had an impact on their child or teen's willingness to try new things, and 51.4% felt that camp had an impact on independence.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact - State

### **Key theme – 4-H Horse Program**

a. Activity –Connecticut ranks 3<sup>rd</sup> per capita in horse density with over 43,000 horses. Total annual horse industry business income in the state is estimated to be \$443,033,360. The total value of non-horse assets owned by businesses is estimated to be \$4,234,083,080. The total value of non-horse assets held by owners is estimated at \$8,402,997,993. The 4-H Horse Program educated 4-H participants to all aspects of effective horse management. Academic endeavors were stressed, and responsible horsemanship practices reviewed and taught. A focus was to continue the Connecticut State 4-H Horse Contest. This enabled 4-H members to be evaluated on and display their academic prowess with regard to hippology, horse judging, and horse quiz bowl, team demonstrations, individual demonstrations and public speaking. The target audience was horse project participants who focused on academic horse study.

b. Impact – A scoring worksheet was very well received, getting a 4.5/5 upon evaluation. The Horse 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. Three of the top teams and one individual speaker competed on the national level in Kentucky. Many contestants commented on how studying for state contest greatly improved their ability to retain information for other school subjects. The Quiz Bowl

team placed 4<sup>th</sup> overall, the Public Speaking presenter placed ninth, and the Hippology team placed 2<sup>nd</sup> in team problems in this National Contest.

c. Source of Federal Funds – Smith-Lever b/c

d. Scope of Impact – State

## **Stakeholder Input Process**

The stakeholder input process was developed to follow upon efforts that had been initiated prior to the submission of the Plan of Work for 2000-2004. The college-wide stakeholder input process included both research and Extension. The annual key event has been the Leaders' Forum which was not held in 2006.

Other efforts conducted within, as well as outside of the College, include needs and trends as identified in a needs assessment conducted by Extension volunteers, critical and emerging state needs, program participants and public outcry. Other means by which stakeholder input is achieved include the annual faculty and staff workshop, the Extension Bulletin, and formal surveys such as the needs assessment of non-English speaking farm employees.

## **Focus on Evaluation**

As a result of the 2003 Department of Extension program review conducted by CSREES, action has occurred related to the identifying of needs to increase impact data. Dr. Trish Manfredi, retired University of Massachusetts Extension administrator, conducts training for Extension faculty both in centers as well as in academic departments. As a result, an increase in formal program planning for expected outcomes, that also includes the planning for stakeholder input, has occurred.

One example is the planning and implementation of a process to gather stakeholder input. Dr. Manfredi has met with the state Extension partners group and with three of the eight Extension councils. She developed a process for collecting stakeholder input in the format of what is on your mind questionnaire. A final report is expected.

## **Extension Volunteers**

Extension volunteers comprise the state Extension Partners group that meets three times a year. The group is comprised of representatives of Extension Councils and other affiliated organizations such as 4-H camp boards, IFYE, and the Master Gardener Association. The Partners group has focused this year on contacts with legislators. Connecticut volunteers organized their own trip to D.C. for the third year and planned and conducted their third Legislative Reception at the Capital. The 4-H teen ambassadors conducted their second legislative breakfast as part of the annual 4-H Citizenship Day as a means to assist in gathering input into programs.

## **Critical and Emerging State Needs**

Stakeholder input comes from a wide variety of sources including local crisis or interest of state legislators to resolve local needs. One example of a crisis identified need was the very low water flow of the Fenton River that supplies the University's water needs. Faculty were asked to assess the situation and make appropriate recommendations. Members of the General Assembly identified needs in the state through a stakeholder session around Integrated Pest Management that lead to additional funding for that program. Nutrient management plans are a high priority for the state and legislative interest has moved this program priority forward.

Issues brought to the attention of faculty include potential funding opportunities in risk management. This partnership with the Department of Agriculture identified the lack of producers using the crop insurance program. As a result of this need, funding was received and programming has evolved with a significant increase in the purchase and use of crop insurance. A long standing success with the Quinebaugh Shetucket National Heritage Corridor lead to developing a relationship with the newly designated Housatonic River Corridor. Preliminary conversations are assessing the need for programming within that watershed. The Green Valley Institute conducted an educational needs and interest assessment of community leaders in the Quinebaugh-Shetucket National Heritage Corridor published in December 2005.

### **Program Participants and Public Concern**

Program participant surveys and public outcry are also used as two methods to identify stakeholder input. For example, a survey of program participants in the Jordan Cove watershed identified the need for additional training programs. The public outcry over the increasing population of coyotes in suburban and urban areas lead to an assessment of the problem. Customers of greenhouse grown plants demand an insect free product. This drives the nature and scope of programming effort in an attempt to balance a reduced use of pesticides as well. The need for a Women in Agriculture organization within the state was identified by a key stakeholder. Working with this person, faculty members have developed and implemented a network of female agricultural producers who are now planning and developing programs.

### **Faculty and Staff Annual Workshop**

Each year the College Faculty and Staff Workshop includes a component of facilitated table discussion among participants. Faculty and program staff are assigned to tables to reflect the diversity of programs within the college. Based on the program of the morning, time is then devoted to discussion on the impact of the presentations on our work. Based on the theme *Frontiers of Excellence* questions related to the new college strategic plan, the greatest issues facing our future, ideas that faculty would like to see administration embrace, and ways to better inform people of our work. Results were tabulated by table and will be compared to the results of the 2007 workshop facilitated conversation to assess trends.

### **Extension Bulletin**

Each month the associate director publishes a newsletter to update the Extension faculty on programs, grants and conferences. An important component of that newsletter is the inclusion of recent trend data and needs identified by clientele during the course of conversations over the past month. Topics related to needs assessment have included population trends in New England, as well as readings such as books including *The Tipping Point* and *Blink*.

### **Survey of Needs for Non-English Speaking Farm Employees**

A team of faculty both in the Department of Plant Science and the Department of Extension spent a year and a half designing and conducting a two-prong study. The first prong identified the needs of production agriculture owners and managers related to their non-English speaking employees. This is a more sizable population in the state than expected with very diverse backgrounds and needs. One surprise finding was related to the number of languages spoken by employees. The assumption had been that the majority spoke Spanish and that proved not to be the case. Needs identified by owners included materials in languages appropriate for their

employees related to pesticide use and health and safety issues. This was followed by a conference related to immigration issues and migrant farm workers in the state.

These are just a few examples of the diversity of stakeholder input sought for the Connecticut research and Extension programs.

## **Program Review Process**

There were changes in the program review process for Extension compared to the original Plan of Work.

### **Merit Review for Smith Lever Funds**

The merit review process for Connecticut continues to consist of the four components identified in the Plan of Work for 2000-2004 (page 228). The Department of Extension consisting of the eight extension centers was reviewed in 2003 with the final report received in 2004.

Recommendations included engaging in a strategic planning process; developing a stronger system to measure impacts, exploring means for stronger financial support, and defining goals for branding and marketing. This completes the external review process of all departments.

Results from external review processes and from stakeholder input were used for the development of the new college-wide five-year strategic plan. Extension goals identified in this plan included:

- Increase the economic opportunities for small business, specifically in agriculture and natural resources.
- Enhance the sustainability of the environment through balanced economic growth.
- Advance the public health of the state through a safe and secure food system.
- Strengthen and support families and communities in a rapidly changing environment.

The entire College plan was developed by the Dean's office and then presented to the Leaders' Forum and to the Faculty and Staff Workshop for review. Comments of interest from the faculty and staff included a need to integrate CSBDC, not enough focus on undergraduate students and research, concerns regarding workforce development, excitement around increased technology opportunities, economic opportunities, and sustainability. The strategic plan is posted on the college web site for public comment. This was followed by the development of a new University wide strategic plan that is currently being reviewed.

In addition, the Dean presented this document for review to the other deans within the institution. Following those presentations, the Provost Office made significant organizational changes based. As a result, the College will acquire the Department of Allied Health Sciences as of July 1.

In addition, Dr. Manfredi conducted an extensive review of the 2007-2011 Plan of Work proposal, as did department heads and faculty within the departments. This document will be posted on the college web site for public comment.

The five year plan of work components included: planning by all faculty and staff on three levels, a university wide review of the plan, a review by the Northeast institutions will be requested, and a review by the stakeholders.

### **Peer Review for Hatch, McIntire-Stennis, and Animal Health Projects**

The peer review procedure is designed to ensure that the highest quality research projects consistent with identified priorities are eventually approved. In brief, the review involves

obtaining the objective opinion of other scientists, and/or administrators usually within the University of Connecticut, and users of research results when appropriate, to research proposals or completed projects. The general goal of peer review is to subject every project to a rigorous and systematic evaluation for both its appropriateness and quality.

The process is conducted within the framework of predetermined criteria whose objective is to assess whether each Storrs AES research project (1) is guided by state, regional, and national priorities, (2) is of high scientific merit and quality, (3) incorporates a state-of-the-art scientific approach to the topic investigated, (4) is likely to successfully meet the goals of the project, and (5) whether it is complete and prepared according to the Storrs AES guidelines. It is expected that the peer review process will afford the Principal Investigator(s) the benefit of the best counsel the system can provide.

The appropriate Department Heads serve as the focal point for the peer review process and suggest 2-3 faculty, usually within the University, as qualified reviewers for a given project. The Director of the Storrs AES (or his Associate Director) is the ultimate authority to finally approve projects once they have been critically reviewed and been endorsed by the Department Head.

## **Evaluation of the Success of Multi and Joint Activities**

Evaluation of the success of multi-state, multi-institutional, and multidisciplinary activities, and joint research and extension activities, in addressing critical agricultural issues identified in the Connecticut 5-Year FY 2000-2004 Plan of Work, as amended by the FY 2005-2006 Plan of Work, was conducted in the context of the four evaluation criteria identified in the Guidelines for State Plans of Work. Comments are offered as follows:

*Did the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?*

Activities conducted by Connecticut faculty and staff addressed the critical issues identified in the FY 2005-2006 Plan of Work and those subsequently identified by stakeholders.

In the area of a *Competitive Agricultural System* (Goal 1) considerable success was achieved.

Animal research trials saw positive efficiency of a previously-developed recombinant DNA vaccine for Infectious Bronchitis virus, a highly contagious respiratory and urogenital disease of chickens.

Cloning highlights included major research work in the areas of reproductive physiology and animal biotechnology, particularly cloning and transgenic technology to improve animal reproductive efficiencies. Emphasis was placed on improving cloning techniques and understanding various mechanisms in nuclear-cytoplasmic interactions and genetic reprogramming during nuclear transfer. This work received considerable national and international financial support and media coverage.

Public understanding of milk pricing problems were enhanced through the application of exhaustive investigations of retail milk pricing in the region, resulting in extensive and intensive interactions on various public policy fronts, especially at the State legislature.

Surveillance programs to monitor poultry and other birds' diseases resulted in control of ILT and infectious bronchitis control. 3.8 million birds were protected from IBVD spread. Extension efforts to deal with poultry pests through reduced fly and pest populations were found to be effective, with cost savings realized by many producers.

Connecticut agricultural producers increased their viability and improved profitability through risk management education. USDA, RMA and CT crop insurance agents indicate significantly increased participation in crop insurance programs by Connecticut producers as a result of these programs. New developments include partnering with: Northeast Transfer the Farm Project coordinated by University of Vermont Extension, an agricultural marketing workshop series co-sponsored by the UConn Farm Risk Management team, Connecticut Farm Bureau Association and Connecticut Department of Agriculture, and participation in planning the Northeast Farm Transfer Service Providers Network.

In the areas of a *Safe and Secure Food System* (Goal 2) Extension and research efforts in the Hazard Analysis Critical Control Point (HACCP) system saw meat and poultry processors completing prerequisite programs to develop HACCP plans for their businesses.

Work in the area of a *Healthy and Well-Nourished Population* (Goal 3) saw a number of activities.

A first-of-its-kind food security study identified pockets of food insecurity across Connecticut and helped lead to increased networking opportunities for emergency food providers.

Program participants in the Expanded Food and Nutrition Education Program (EFNEP) realized significant improvements in diets and food-related behavior, with reduced allocation of funds for food purchases.

Research on egg consumption and coronary heart disease risk resulted in an important recommendation not to eliminate foods such as eggs from the diet as there is no association between dietary cholesterol and CVD risk.

Research on the role of green tea in lowering blood levels of cholesterol suggested that green tea consumption may help reduce the risk of coronary heart disease.

A number of projects were implemented in the area of *Greater Harmony Between Agriculture and the Environment* (Goal 4). The projects addressed the important issues of invasion species, land use, and nutrient management.

Programs were focused on both the local and national level through the highly acclaimed NEMO program (Nonpoint Education for Municipal Officials). At the state level, NEMO efforts resulted in programs delivered to representatives from virtually all Connecticut towns; with communities revising their comprehensive plans and/or taking other important public policy actions to better protect water resources. As a result of educational training, towns across the state are incorporating better stormwater management practices into their land use plans and regulations. On the national level, the NEMO Network expanded to 33 programs in over 30 states. NEMO Network programs are assisting communities across the nation to better plan and design development.

The Green Valley Institute (GVI), designed to address the critical issue of natural resource conservation and land use planning in the Quinnebaug-Shetucket National Heritage Corridor, saw many outcomes, including the creation and revitalization of several conservation commissions, incorporation of natural resource inventory data in town master plans, and the adoption of new conservation subdivisions.

Extension education programs for agricultural producers resulted in participating farms reducing their nutrient usage in significant ways through nutrient management planning. Also, the Connecticut Department of Environmental Protection initiated a market study on the use of compost products in the state.

Integrated pest management (IPM) research and education programs were targeted at most major crops in Connecticut. IPM programs resulted in significant reductions in usage of various pesticides and/or use of less toxic materials or approaches in pest management.

Research and extension efforts in the area of invasive plant species resulted in the development of a biological control project on purple loosestrife – a plant species that invades wetland areas. Purple loosestrife control is being realized across regions of Connecticut, and the public is demonstrating considerable interest in the overall issue of invasive species and means to manage the problem within the regional and local landscape.

Results from a paired watershed residential water quality project saw numerous changed landscape management practices and significant reductions in bacteria and nitrate-nitrogen leaving the targeted watershed.

Efforts in the area of *Enhanced Economic Opportunity and Quality of Life for Americans* (Goal 5) were many and varied. Included were managing your money, lead education, people empowering people and youth workforce development.

Extension programs in family resource management focused on issues related to increased debt and personal bankruptcies. Educational programs reached numerous audiences, including single females and low-income individuals. Increased money management skills resulted, according to survey responses.

As a result of participating in the Managing Your Money Series, 91% of social service agency staff indicated that they would share information with their co-workers and 40% planned to present a money management program at their agency.

Parenting education programs were designed to enhance healthy family functioning through positive parent-child interactions, communications and discipline techniques. A Parenting People program series in Danbury found 80% of parents demonstrated improved parenting skill and 100% reported they were using or planning to use new skills as a result of the program.

Another program highlight included a program for 4-H youth that offered youth leadership/philanthropic programs designed to raise and distribute funds. Youth United students raised \$1,800 dollars and awarded two grants of \$750 that focused on conducting drug free activities in the Danbury area.

*How Mother Bear Taught the Children about Lead*, a lead-poisoning prevention curriculum for Native American children, has been added to the National Institute for Environmental Health Sciences (part of NIH) website and is expected to be printed and distributed nationally by the CDC.

*Did the planned programs address the needs of under-served and under-represented populations of the State(s)?*

Many of the programs that were implemented addressed the needs of under-served and under-represented populations. Included were lower income residents through the EFNEP nutrition

program, and lower income and minority youth and adults through parenting and child care programs. In addition lower income agricultural producers benefited from risk management education programs, and decision-makers in less affluent municipalities increased public policy decision-making as a result of natural resource/land use protection programs. A needs assessment determined bilingual education needs for migrant and seasonal workers in agriculture.

*Did the planned programs describe the expected outcomes and impacts?*

Planned programs reached varying stages in meeting expected outcomes as described in the 2000-2004 Plan of Work, and as amended with the FY 2005-2005 Plan of Work. The nature of research and educational programs are such that implementation strategies and program impacts occur at varying rates depending upon number of faculty and staff involved, resources available, audiences involved, partnerships required, and outcomes expected (short-term, mid-term, long-term). In general, Connecticut programs continue to be on track in meeting the anticipated outcomes and impacts. Continued progress is expected toward outcomes in subsequent reporting periods. It must, however, be strongly emphasized that in many instances continued progress toward meeting many of the above cited issues of critical state, regional and national importance will be dependent upon increased levels of funding from federal and state sources.

*Did the planned programs result in improved program effectiveness and/or efficiency?*

Improved effectiveness and/or efficiency results were seen in many instances. For example, nutrition education programs such as EFNEP saw improved diets and reduced financial allocations for purchased food items. Land use education programs saw improved decision making to protect natural resources and develop viable communities through better decision-making. Agricultural producers saw reduced pesticide usage, combined with increase product quality through IPM program adoptions.

The following are specific examples of multi and integrated programs provided as examples of improved program effectiveness and efficiency.

Plant Science and Extension faculty work across the twelve northeastern states to provide plant diagnostic services for the greenhouse, nursery and ornamental industry and in the area of integrated pest management.

(W-1133) Benefits and Costs of Natural Resources Policies Affecting Public and Private Lands. The primary goal of the project is to improve the policy process which influences agricultural and natural land preservation. To accomplish this goal, the project seeks to better model and estimate public preferences for farm and forest preservation, including preferences for the growth control and public access services provided by preservation activities. Through this increased knowledge of public preferences, the project will assist policymakers in the design of farm and forest preservation policies that better serve the public interest and provide valued amenities in the most cost-effective manner.

(W-1004) Marketing, Trade, and Management of Fisheries and Aquaculture Resources. Given the present crisis in New England fisheries, there is an urgent need to reform fisheries management if fisheries are to be conserved and fishing communities are to remain viable. Alternative fisheries management strategies, such as co-management, community based management and harvest cooperatives, show promise of making management more equitable, efficient and sustainable. However, there are many different fisheries operating in the five coastal states of New England, and as such, there is a need to determine which management strategy(s) would be most effective for each fishery and how best to design and implement these strategies. The goal of this project is to develop new fisheries management strategies that can be applied to New England fisheries, thereby improving management outcomes for both the fishing industry and fisheries resources.

(NE-1009) Mastitis Resistance to Enhance Dairy Food Safety. Intramammary antibiotic treatment administered at 10 to 21 d prior to anticipated parturition resulted in 8.82% of heifers with detectable antibiotic residues in milk at the sixth milking postpartum and 3.68% residues at the tenth milking. The risk for residues decreased with increased milking number following parturition and increased interval, in days, between prepartum antibiotic treatment and parturition. Treating heifers with an antibiotic at greater than 14 d prior to anticipated parturition and testing milk for antibiotic residues will reduce the risk of residues resulting from prepartum intramammary therapy of periparturient heifers.

(NE-1022) Poultry Production Systems: Optimization of Production and Welfare Using Physiological, Behavioral and Physical Assessments. Preliminary findings indicate that noise may be an environmental factor of concern for poultry. Since OSHA has developed guidelines for workplace noise levels for humans, it may not be long before similar regulations are developed for domestic farm animal species. Vocalization analysis/monitoring may be a method of determining the welfare of poultry under commercial conditions. Isolating the vocal pattern for different distress calls may be used to monitor the level of distress the birds are demonstrating under various commercial conditions.

(NE-1007) Ovarian and Environmental Influences on Embryonic/Fetal Mortality in Ruminants. Better understanding of the factors that affect the functional luteal lifespan of the corpus luteum and therefore the length of the estrous cycle may lead to better methods of estrous cycle control, enhanced fertility and decreased embryonic losses.

(W-1171) Germ Cell and Embryo Development and Manipulation for the Improvement of Livestock. Advantages include the production of more desirable products, new products, value-added products and increased efficiency of the utilization of natural resources. The development of transgenic animals used for food and fiber production has significant potential for consumers, animal producers, their communities and our environment. Potential examples of such transgenic animals are those producing a milk containing human proteins to make a more desirable human baby formula, those producing a leaner, more desirable meat, or those more efficient in growth, reproduction, wool production, or milk production including those with increased disease resistance (Wall, 2002; Wheeler et al., 2003). Increased efficiencies in production of animal products can be of economic benefit to both consumers and producers and have obvious advantages to the environment in terms of reduced use of natural resources.

(NRSP-3) The National Atmospheric Deposition Program. Atmospheric mercury deposited to land and tree surfaces accumulates in tree leaves to the point where it is a major compartment in the mercury cycle in areas with tree cover. Relatively large amounts of mercury are cycled to the ground surface when the leaves fall. Tree leaves in suburban areas are often composted. This study is aimed at quantifying the Hg budget of decomposing tree leaves.

(W-1002) Nutrient Bioavailability--Phytonutrients and Beyond. Study results show: 1) Egg may be used as a vehicle for delivering bioavailable carotenoids in humans and 2) Green tea or catechins lower the intestinal absorption of fat and fat-soluble compounds by inhibiting pancreatic phospholipase A2. The findings indicate that the absorption and bioavailability of fat-soluble compounds are significantly influenced by egg intake in humans and green tea in rats. Data may be used as a basis for specific dietary recommendations regarding the inclusion of eggs and green tea in diets for the prevention and treatment of certain diet-related diseases and disorders.

(NE-1023) Improving Plant Food (Fruit, Vegetable and Whole Grain) Availability and Intake in Older Adults. Improve methods of measuring intake of fruit, vegetables and whole grains to include biomarkers, dietary assessment and associations with obesity, other biomarkers and functional endpoints in older adults. Develop effective assessment techniques and intervention strategies to improve intake of fruit, vegetables and whole grains by older adults.

(NC-1019) Control of Emerging and Re-emerging Poultry Respiratory Diseases in the United States. Identify reservoirs of infectious respiratory disease agents in wild birds and poultry. Develop improved diagnostic capabilities including real time PCR as well as other rapid on-farm tests for economically important respiratory diseases. Develop new prevention and control strategies for poultry respiratory diseases.

(NC-229) Porcine Reproductive & Respiratory Disease: Methods for the Integrated Control, Prevention & Elimination of PRRS in United States Swine Herds. Porcine reproductive and respiratory syndrome (PRRS) is considered the most economically significant endemic infectious disease problem facing the US swine industry today. Work will contribute a fundamental understanding of mechanisms influencing PRRS in swine.

(NC-7) Conservation, Management, Enhancement and Utilization of Plant Genetic Resources. Crimson Pygmy barberry, one of the most important U. S. nursery crops, produces substantially less seed than other common purple-leaf forms or the wild green form. It may be acceptable to allow continued production of this specific genotype because there is reduced risk of it spreading into unmanaged areas due to its reduced sexual reproductive capacity. Preliminary data suggests there may be other barberry genotypes that pose less of an environmental risk, based on reduced seed set. On the other hand, we have found that purple plants produce seedlings that can establish in unmanaged areas and a large number of the seedlings can exhibit green foliage. Furthermore, genetically purple plants growing in shaded, unmanaged areas will appear green, since development of the purple pigment anthocyanin is dependent on high light levels. These findings dispel the common belief that invasions of green barberry could not have been started by purple forms of barberry.

(NE-1025) Biology, Ecology and Management of Emerging Pests of Annual Bluegrass on Golf Courses. Anthracnose is an increasing disease problem of annual bluegrass. The purpose of this study is to learn more about the biology of the pathogen and management of the disease.

(S-1024) Discovery of Entomopathogens and their Integration and Safety in Pest Management Systems. The goal of the proposed research is to study factors likely to influence the success of augmentative uses of *Metarhizium anisopliae* var. *anisopliae* (Metsch). Sorokin against scarab larvae. We will test the hypothesis that subsurface applications and applications done during aeration will provide better control of the Japanese beetle larvae.

(W-1001) Population Change in Rural Communities. Describe the recent redistribution of population between rural and urban areas, examine the dynamics of these changes (births, deaths, internal and international migration), and investigate their social and economic determinants, paying attention to areas of persistent out-migration, rapidly developing areas, and the urban-rural interface. Examine the effects of changes in official classification schemes (including newly created micropolitan areas and urban clusters) on the validity of commonly used rural definitions (e.g., nonmetropolitan), and consequently on the changes in the size and composition of the rural population. Analyze the growth and decline of at-risk populations in rural America, including the elderly, the working poor, immigrants, and racial and ethnic minorities. Investigate the impacts of changes in population size and composition on local quality of life, economic security, and access to essential goods and services.

**U.S. Department of Agriculture**  
**Cooperative State Research, Education, and Extension Service**  
**Supplement to the Annual Report of Accomplishments and Results**  
**Actual Expenditures of Federal Funding for Multistate Extension and Integrated Activities**  
(Attach Brief Summaries)  
**Fiscal Year: 2006**

**Select One:**      ☐ **Interim**    ☒ **Final**

**Institution:**      University of  
Connecticut

**State:**              Connecticut

	<b>Integrated Activities (Hatch)</b>		<b>Multistate Extension Activities (Smith-Lever)</b>		<b>Integrated Activities (Smith-Lever)</b>
<i>Established Target %</i>	25	%	3	%	25
<i>This FY Allocation (from 1088)</i>	966,010		1,930,809		1,930,809
<i>This FY Target Amount</i>	241,502		57,924		482,702
<b>Title of Planned Program Activity</b>					
Assessments			6,131		
Food & Safety	70,480		6,197		62,909
Natural Resources	25,826		46,402		96,988
Dairy & Livestock	99,764		5,345		71,571
Sustainable Agriculture	44,083		42,481		140,773
Horticulture	15,668		419		41,876
Publications					73,289
Economic Viability	1,000				26,024
<b>Total</b>	256,821		106,975		513,430
<b>Carryover</b>					

**Certification:** I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays represented here accurately reflect allowable expenditures of Federal funds only in satisfying AREERA requirements.



**Director**

3/30/07

**Date**

### ***Multi-State Extension Activities – Brief Descriptions***

Multi-state Extension activities evolved from a Connecticut base where an integrated program approach was followed through the context of small groups and college-wide teams. This approach allowed for the development and implementation of a variety of Extension, research and integrated Extension/research programs both within the state and on a multi-state basis, where appropriate. Research and Extension programs are based on needs identified by stakeholders.

- Public understanding of milk pricing problems were enhanced through the application of exhaustive investigations of retail milk pricing in the region, resulting in extensive and intensive interactions on various public policy fronts, especially at the State legislature.
- Surveillance programs to monitor poultry and other birds' diseases resulted in control of ILT and infectious bronchitis control. 3.8 million birds were protected from IBVD spread. Extension efforts to deal with poultry pests through reduced fly and pest populations were found to be effective, with cost savings realized by many producers.
- Connecticut agricultural producers increased their viability and improved profitability through risk management education. USDA, RMA and CT crop insurance agents indicate significantly increased participation in crop insurance programs by Connecticut producers as a result of these programs. The Farm Risk Management team's work in crop insurance and farm risk management education from 2001 to 2006 has resulted in development of a broad based farm risk management Extension education program in the College of Agriculture and Natural Resources, helping to create a partnership with the State's agricultural community that includes advising and participation in farm risk management programs. New developments include partnering with: Northeast Transfer the Farm Project coordinated by University of Vermont Extension, an agricultural marketing workshop series co-sponsored by the UConn Farm Risk Management team, Connecticut Farm Bureau Association and Connecticut Department of Agriculture, and participation in planning the Northeast Farm Transfer Service Providers Network.
- In the areas of a *Safe and Secure Food System* (Goal 2) Extension and research efforts in the Hazard Analysis Critical Control Point (HACCP) system saw meat and poultry processors completing prerequisite programs to develop HACCP plans for their businesses.
- Programs were focused on both the local and national level through the highly acclaimed NEMO program (Nonpoint Education for Municipal Officials). At the state level, NEMO efforts resulted in programs delivered to representatives from virtually all Connecticut towns; with communities revising their comprehensive plans and/or taking other important public policy actions to better protect water resources. As a result of educational training, towns across the state are incorporating better stormwater management practices into their land use plans and regulations. On the national level, the

NEMO Network expanded to 33 programs in over 30 states. NEMO Network programs are assisting communities across the nation to better plan and design development.

- The Green Valley Institute (GVI), designed to address the critical issue of natural resource conservation and land use planning in the Quinnebaug-Shetucket National Heritage Corridor, saw many outcomes, including the creation and revitalization of several conservation commissions, incorporation of natural resource inventory data in town master plans, and the adoption of new conservation subdivisions.
- Research and extension programs for agricultural producers resulted in participating farms reducing their nutrient usage in significant ways through nutrient management planning. Also, the Connecticut Department of Environmental Protection initiated a market study on the use of compost products in the state.
- Integrated pest management (IPM) research and education programs were targeted at most major crops in Connecticut. IPM programs resulted in significant reductions in usage of various pesticides and/or use of less toxic materials or approaches in pest management.
- Research and extension efforts in the area of invasive plant species resulted in the development of a biological control project on purple loosestrife – a plant species that invades wetland areas. Purple loosestrife control is being realized across regions of Connecticut, and the public is demonstrating considerable interest in the overall issue of invasive species and means to manage the problem within the regional and local landscape.
- Results from a paired watershed residential water quality project saw numerous changed landscape management practices and significant reductions in bacteria and nitrate-nitrogen leaving the targeted watershed.
- *How Mother Bear Taught the Children about Lead*, a lead-poisoning prevention curriculum for Native American children, has been added to the National Institute for Environmental Health Sciences (part of NIH) website and is expected to be printed and distributed nationally by the CDC.

## **Integrated Activities (Hatch) – Brief Descriptions**

Integrated research and Extension activities as related to Hatch Act funds evolved from a Connecticut base where an integrated program approach was followed through the context of small groups and college-wide teams. This approach allowed for the development and implementation of a variety of Extension, research and integrated Extension/research programs both within the state and on a multi-state basis, where appropriate. Research and Extension programs are based on needs identified by stakeholders.

- Animal research trials saw positive efficiency of a previously-developed recombinant DNA vaccine for Infectious Bronchitis virus, a highly contagious respiratory and urogenital disease of chickens.
- Public understanding of milk pricing problems were enhanced through the application of exhaustive investigations of retail milk pricing in the region, resulting in extensive and intensive interactions on various public policy fronts, especially at the State legislature.
- Surveillance programs to monitor poultry and other birds' diseases resulted in control of ILT and infectious bronchitis control. 3.8 million birds were protected from IBVD spread. Extension efforts to deal with poultry pests through reduced fly and pest populations were found to be effective, with cost savings realized by many producers.
- A first-of-its-kind food security study identified pockets of food insecurity across Connecticut and helped lead to increased networking opportunities for emergency food providers.
- Programs were focused on both the local and national level through the highly acclaimed NEMO program (Nonpoint Education for Municipal Officials). At the state level, NEMO efforts resulted in programs delivered to representatives from virtually all Connecticut towns; with communities revising their comprehensive plans and/or taking other important public policy actions to better protect water resources. As a result of educational training, towns across the state are incorporating better stormwater management practices into their land use plans and regulations. On the national level, the NEMO Network expanded to 33 programs in over 30 states. NEMO Network programs are assisting communities across the nation to better plan and design development.
- Research and extension programs for agricultural producers resulted in participating farms reducing their nutrient usage in significant ways through nutrient management planning. Also, the Connecticut Department of Environmental Protection initiated a market study on the use of compost products in the state.
- Integrated pest management (IPM) research and education programs were targeted at most major crops in Connecticut. IPM programs resulted in significant reductions in usage of various pesticides and/or use of less toxic materials or approaches in pest management.

- Results from a paired watershed residential water quality project saw numerous changed landscape management practices and significant reductions in bacteria and nitrate-nitrogen leaving the targeted watershed.

### ***Integrated Activities (Smith-Lever) – Brief Descriptions***

Integrated research and Extension activities as related to Smith-Lever funds evolved from an integrated program approach that was followed through the context of small groups and college-wide teams. This approach allowed for the development and implementation of a variety of Extension, research and integrated Extension/research programs both within the state and on a multi-state basis, where appropriate.

- Public understanding of milk pricing problems were enhanced through the application of exhaustive investigations of retail milk pricing in the region, resulting in extensive and intensive interactions on various public policy fronts, especially at the State legislature.
- Surveillance programs to monitor poultry and other birds' diseases resulted in control of ILT and infectious bronchitis control. 3.8 million birds were protected from IBVD spread. Extension efforts to deal with poultry pests through reduced fly and pest populations were found to be effective, with cost savings realized by many producers.
- Connecticut agricultural producers increased their viability and improved profitability through risk management education. USDA, RMA and CT crop insurance agents indicate significantly increased participation in crop insurance programs by Connecticut producers as a result of these programs. The Farm Risk Management team's work in crop insurance and farm risk management education from 2001 to 2006 has resulted in development of a broad based farm risk management Extension education program in the College of Agriculture and Natural Resources, helping to create a partnership with the State's agricultural community that includes advising and participation in farm risk management programs. New developments include partnering with: Northeast Transfer the Farm Project coordinated by University of Vermont Extension, an agricultural marketing workshop series co-sponsored by the UConn Farm Risk Management team, Connecticut Farm Bureau Association and Connecticut Department of Agriculture, and participation in planning the Northeast Farm Transfer Service Providers Network.
- In the areas of a *Safe and Secure Food System* (Goal 2) Extension and research efforts in the Hazard Analysis Critical Control Point (HACCP) system saw meat and poultry processors completing prerequisite programs to develop HACCP plans for their businesses.
- A first-of-its-kind food security study identified pockets of food insecurity across Connecticut and helped lead to increased networking opportunities for emergency food providers.
- Program participants in the Expanded Food and Nutrition Education Program (EFNEP) realized significant improvements in diets and food-related behavior, with reduced allocation of funds for food purchases.

- Programs were focused on both the local and national level through the highly acclaimed NEMO program (Nonpoint Education for Municipal Officials). At the state level, NEMO efforts resulted in programs delivered to representatives from virtually all Connecticut towns; with communities revising their comprehensive plans and/or taking other important public policy actions to better protect water resources. As a result of educational training, towns across the state are incorporating better stormwater management practices into their land use plans and regulations. On the national level, the NEMO Network expanded to 33 programs in over 30 states. NEMO Network programs are assisting communities across the nation to better plan and design development.
- The Green Valley Institute (GVI), designed to address the critical issue of natural resource conservation and land use planning in the Quinnebaug-Shetucket National Heritage Corridor, saw many outcomes, including the creation and revitalization of several conservation commissions, incorporation of natural resource inventory data in town master plans, and the adoption of new conservation subdivisions.
- Research and extension programs for agricultural producers resulted in participating farms reducing their nutrient usage in significant ways through nutrient management planning. Also, the Connecticut Department of Environmental Protection initiated a market study on the use of compost products in the state.
- Integrated pest management (IPM) research and education programs were targeted at most major crops in Connecticut. IPM programs resulted in significant reductions in usage of various pesticides and/or use of less toxic materials or approaches in pest management.
- Research and extension efforts in the area of invasive plant species resulted in the development of a biological control project on purple loosestrife – a plant species that invades wetland areas. Purple loosestrife control is being realized across regions of Connecticut, and the public is demonstrating considerable interest in the overall issue of invasive species and means to manage the problem within the regional and local landscape.
- Results from a paired watershed residential water quality project saw numerous changed landscape management practices and significant reductions in bacteria and nitrate-nitrogen leaving the targeted watershed.
- Parenting education programs were designed to enhance healthy family functioning through positive parent-child interactions, communications and discipline techniques. A Parenting People program series in Danbury found 80% of parents demonstrated improved parenting skill and 100% reported they were using or planning to use new skills as a result of the program.
- *How Mother Bear Taught the Children about Lead*, a lead-poisoning prevention curriculum for Native American children, has been added to the National Institute for

Environmental Health Sciences (part of NIH) website and is expected to be printed and distributed nationally by the CDC.