Connecticut Annual Report of Accomplishments FY 2005

Connecticut Cooperative Extension System
Storrs Agricultural Experiment Station

This certifies that the University of Connecticut has submitted their Fiscal Year 2005 Annual Report of Accomplishments.

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Table of Contents

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 efforts saw the successful development of a recombinant DNA vaccine for Infectious Bronchitis virus, a highly contagious respiratory and urogenital disease of chickens. Trials are currently under way in 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.

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. Surveillance programs to monitor poultry and other birds' diseases resulted in control of ILT and infectious bronchitis control. 3.5 million birds were protected from IBVD spread.

Involvement by College faculty in a major lobster mortality event in Long Island Sound enabled researchers to identify the impact transient exposure to relatively low concentrations of malathion can have on defense mechanisms, possibly making them more susceptible to infections.

Development of 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, introduction of new and valuable ornamental crops for production and marketing in the state, development of factual information to better describe the collapse of the lobster industry in western Long Island Sound, and world-leading 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	310,714	5.74

Hatch	22,905	0.60
Multi-state research	60,200	1.09
State funds	6,329,054	111.60
Competitive grants	979,517	26.74
Animal health	-	-
Total	8,637,390	145.77

Key Theme - Transgenic Swine for Xeno-Transplantation

a. Activity – 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 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).

b. Impact – Ten swine have been produced that possess at least one of the three constructs. Several manuscripts have been published pertaining to these projects.
The outcomes of this project could lead the way to treatment of Parkinson's disease and regeneration of injured nerve tissue.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Animal Cloning and Biotechnology

a. Activity –The research goal was to improve animal reproductive efficiencies by developing and optimizing various reproductive biotechnologies, with a focus on improving cloning techniques and understanding of various mechanisms in nuclear-cytoplasmic interactions and genetic reprogramming during nuclear transfer. Additionally, expert testimony regarding stem cell legislation in Connecticut involved the crafting of language in Bill 934, "An act permitting stem cell research and banning human cloning."

b. Impact – Approximately 100 peer-reviewed papers including more than 20 papers published in 2004-2005 including two high-profile Nature/ Nature Biotechnology papers. The success of the research has been widely reported around the globe.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Ontogeny of Somatotropic Axis in Beef Cattle

a. Activity –Work focused on identifying changes in several components of the somatotropic 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 works 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 somatotropic axis with age to utilize exogenous somatotropin more efficiently. Analysis has more clearly identified times that somatotropin may have a greater impact.

b. Impact – Results have shown that exogenous somatotropin can increase growth rate 7 to 15% in growing cattle depending on the age, body weight and nutritional plan of the animals. Changes occur in GH, IGF and IGFBP from birth to one year of age in males and females. By more clearly identifying age-related changes in the axis, variation in response to exogenous somatotropin can be reduced and the potential for economic success of beef producers that may utilize somatotropin in the future can be increased.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Zinc and Thyroid Hormone Status

a. Activity - The focus of this work is to investigate the interaction of the endocrine system with nutritional status in growing animals. The somatotropic axis has a central role in the growth rate of young animals. Zinc status and thyroid hormones independently influence growth rate (a deficiency in either reduces growth rate). In addition both are reported to impact the somatotropic axis. The specific objective is to investigate the interactive effects of zinc status and thyroid hormone status on growth rate and determine if the deficiency-induced reduction in growth rate is mediated by changes in the somatotropic axis, including GH, IGF I and IGFBP, 2,3 and 4.

b. Impact – Results have shown that deficiency in either zinc or thyroid hormone reduces growth rate of young rats and impacts the somatotropic axis, but there does not appear to be an interaction between the two.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Animal Disease Surveillance Programs/Potential Bioterrorist Agents

a. Activity – The goal is to identify newly emerging or bioterrorist diseases before they have become widespread. In cooperation with the CT Department of Agriculture (DoAg), the CT Department of Public Health (DPH) and USDA APHIS New England Regional Office, a multifaceted effort has been made to increase animal disease surveillance and improve the capabilities of the Connecticut Veterinary Medical Diagnostic Laboratory (CVMDL) to conduct diagnostic and surveillance testing. The lab is an active participant in the National Animal Health Reporting System, which monitors animal diseases in the United States. The laboratory has also become a USDA approved laboratory for Avian Influenza and Exotic Newcastle disease surveillance program testing. In cooperation with CT DoAg, and USDA APHIS New England Regional Office, live and dead bird surveillance testing for most of the New England states is

conducted. The lab will play a major role in the upcoming live bird market surveillance program for this disease. A cooperative agreement with CT DPH and CT DoAg will used to again conduct equine WNV testing. Horses, humans and crows are among the species most likely to suffer illness from this disease; early detection of the disease in horses can help alert public health officials of increased risk for human infection.

b. Impact – The laboratory has been successful in the identification of West Nile Virus and Avian Influenza outbreaks, among others. These efforts have integrated the laboratory resources and capabilities with other state and regional efforts to detect emerging animal diseases in a timely manner, and to assist in the response to epizootics of disease.

c. Source of Federal Funds – Animal Diseases

d. Scope of Impact – Regional/New England

Key Theme - Virus Research/Virus Vaccines

a. Activity – Research has been targeted at understanding the swine response to infection or vaccination in the context of porcine reproductive respiratory syndrome (PRRS), one of the most important swine diseases affecting the industry. The areas of research include testing the effects of cytokines and other modulators on the response to vaccination or infection, vaccine design and testing parameters of protective immunity. DNA vaccines encoding PRRSV genes have been constructed and tested. The use of cytokines such as IL-2 and IL-4 as vaccine adjuvants is an area of active research. Cytokine bioassay development is another area of current emphasis. The applicability of swIL-2 and sw IL-4 as adjuvants for vaccines was tested in swine in the context of protective immunity against PRRS. West Nile Virus (WNV) remains an important area of interest both at the diagnostic and research levels. A rapid fluorescent antibody test to detect WNV antigen in avian tissues has been recently developed. Significant progress has been made on the development of reagents to measure swine interferon beta.

b. Impact –Two DNA vaccines carrying PRRSV ORFs 5 and 7 which are functional were constructed. Two constructs expressing swine IL-2 or swine IL-4 respectively have been completed. PRRSVORF-5 and ORF-7 and the swine IL-2 and IL-4 genes were transferred to a plasmid that yields a higher expression of protein. These new constructs were shown to be functional in swine in a vaccination and challenge trial. A replication defective adenovirus vaccine carrying ORF4 of PRRSV was constructed and it is currently under evaluation. A series of monoclonal antibodies that recognize swine IFN-β were produced. A replication-defective adenovirus vaccine with PRRSV ORF4 was constructed and is being tested in mice. Vaccination/challenge trials in swine with DNA vaccines and swIL-2 and swIL-4 co-administration were completed. A rapid fluorescent antibody test for detection of WNV in tissues of avian species has been developed. Anti-WNV monoclonal antibodies have been developed and await characterization.

c. Source of Federal Funds – Animal Diseases

d. Scope of Impact – State

Key Theme - Immunotoxicology of Pesticides in Lobsters

a. Activity – Lobsters are economically important fisheries in New England. In the fall of 1999, a massive die-off resulted in reduction of lobster landings in western Long Island Sound that reached 99.9%. Research at UConn revealed a new pathogen, a paramoeba, which caused lesions to the nervous system of lobsters that could explain the death of those animals. It is nevertheless not known if this paramoeba represents a newly introduced, virulent pathogen of lobsters or if it represents a pathogen that was always present in the environment and would have, at once, infected and killed lobsters. The die-off also coincided in time with the application of pesticides to control mosquitoes carrying the newly discovered West Nile Virus. For the fist time, studies allowed for the evaluation of the dose of malathion, methoprene and resmethrin, the three pesticides used for the control of mosquitoes in 1999. Results demonstrated the relative toxicity of the different pesticides compared to each other.

b. Impact – Results demonstrate that transient exposure of adult lobsters to relatively low concentrations of pesticides can affect the defense mechanisms of lobsters and possibly make them more susceptible to infections. When coupled with ongoing modeling efforts to quantify the range of possible concentrations of the different pesticides in Long Island Sound in 1999, results will allow the determination of the likelihood that pesticides were involved in the die-off.

c. Source of Federal Funds – Hatch, Animal Diseases

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 disease in chickens and infectious sinusitis in turkeys, resulting in considerable economic losses in poultry production. Research is 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. Therefore, comparative genetic analysis of virulent and vaccine strains of *M. gallisepticum* will identify candidate virulence-related genes.

b. Impacts - This research will contribute to understanding the virulence of *M. gallisepticum* and the efficacy of existing live *M. gallisepticum* vaccine strains.

c. Source of Federal Funds – Animal Diseases, Hatch

d. Scope of Impact – State

Key Theme - Molecular Diagnostic System for the Identification of *Mycoplasma mycoides* Subspecies *mycoides* Small Colony

a. Activity - *Mycoplasma mycoides* subsp. *mycoides* Small Colony is the etiologic agent of contagious bovine pleuropneumoniae (CBPP). Although eradicated from the United States in 1892, CBPP is an economically significant disease of cattle and is classified as a high consequence livestock pathogen by the United States Department of Agriculture (USDA) and as a list A disease by the International Office of Epizootics (OIE). In collaboration with the USDA Agricultural Research Service a rapid and versatile molecular diagnostic system for the detection

of *M. mycoides* subsp. *mycoides* Small Colony is being developed. This system uses TaqMan probes for the real-time monitoring of PCR amplification of genetic targets.

b. Impacts - Such a system will aid considerably in the effective control of CBPP in the event of a natural or intentional outbreak. The comparative genomic analysis of the virulent/avirulent strains will shed light on the mechanism(s) of pathogenesis employed by this important agricultural pathogen.

c. Source of Federal Funds – Animal Diseases, Hatch

d. Scope of Impact – State

Key Theme - In Vivo Expression of IBV-S Gene in Chicks

a. Activity –Infectious bronchitis (IBV) 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 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. It activates the cells' interferon systems and puts them in an antiviral state. Interferon is being used as an enhancer of the vaccine and should not have a direct influence on the resistance against IBV infection, since it will be introduced one time *in-ovo* injection with the IBV DNA vaccine and the challenge study indicated up to 94% protection after 4 weeks post inoculation.

b. Impact – Recombinant DNA vaccines for Infectious Bronchitis virus have been developed; trials are under way for the efficiency of the vaccine against infectious bronchitis virus infection in chickens using interferon as an enhancer. The development of a recombinant vaccine that contains the S gene and its use in-ovo will be more practical for protecting the chicks before hatching.

c. Source of Federal Funds – Animal Diseases, Hatch

d. Scope of Impact – State

Key Theme - Development of Molecular Diagnostic Techniques

a. Activity –Research was focused on the development of DNA based Polymerase Chain Reaction (PCR) for reovirus, adenovirus, avian encephylomylitis virus; as well as a multiplex PCRs for avian pathogenic mycoplasmas, for serotype Massachusetts and Arkansas infectious bronchitis virus (IBV), and for respiratory avian pathogens.

b. Impact – A multiplex PCR for immunosuppressive avian disease agents and a PCR for avian encephylomylitis virus that can detect and simultaneously differentiate four immunosuppressive avian pathogens in one test was developed. This test will be rapid and cost effective by using one test to diagnose several pathogens.

c. Source of Federal Funds – Animal Diseases, Hatch

d. Scope of Impact – State

Key Theme - Animal Diseases
a. Activity - The Connecticut Veterinary Medical Diagnostic Laboratory (CVMDL) has expanded and improved its services, staffing, equipment and quality assurance program to meet the veterinary diagnostic needs of the region. The CVMDL has gained full accreditation from the American Association of Veterinary Laboratory Diagnosticians, and is becoming a member of the National Animal Health Laboratory Network. In addition to routine veterinary diagnostic work, the laboratory is actively involved in emerging disease surveillance testing, in cooperation with USDA APHIS, the CT Department of Agriculture, CT Department of Environmental Protection and CT Department of Public Health. Current disease surveillance programs include Avian Influenza, Exotic Newcastle Disease, Johne's Disease, West Nile Virus, Salmonella, Chronic Wasting Disease, Scrapie and Bovine Spongiform Encephalitis.

b. Impacts - The laboratory is trained and ready to respond to additional emerging diseases as well as potential bioterrorist or agriterrorist incidents. This increased capability adds a significant animal and public health resource to the region.

c. Source of Federal Funds – Animal Diseases, Hatch

d. Scope of Impact – State

Key Theme - Diagnosis, Therapy and Surveillance of Poultry and Pet Bird Diseases
a. Activity – Efforts focused on a poultry, game and pet bird disease diagnosis, prevention, treatment and control program; food-borne pathogen contamination of poultry eggs and products; and *Salmonella enteritidis* reduction and control program at the poultry farm level. Surveillance of regulatory diseases were reported to public health, Agriculture, and APHIS.

b. Impact – Total Egg laying commercial flocks of 3.5 millions were protected from the spread of Avian influenza, Infectious Bursal Viral Disease, Coryza, Colibacillosis and Pasteurellosis. Low Path H7N2-Avian Influenza was controlled by a successful vaccination program in Connecticut. About 4 million egg laying chickens were saved due to vaccination. No outbreaks of Salmonella food-borne outbreaks related to eggs and egg products from the Connecticut commercial egg farms were reported. A continuing education program on biosecurity, disease surveillance and vaccination of four (4) million egg laying chickens with serotype H7N2 low path AI at the commercial poultry farm stopped the spread of avian influenza from infected farms to other Connecticut poultry.

c. Source of Federal Funds – Smith-Lever

d. Scope of Impact – State

Key Theme - Molecular Characterization and Phylogeny of Chlamydia-like Bacteria from Branchial Epithelium of Farmed Salmonids.
a. Activity – Research focus was on the molecular identification and phylogenetic determination of the yet unculturable chlamydia-like bacteria responsible for gill disease in farmed salmonids.

b. Impact - Successfully isolated and characterized the phylogenetically important 16S ribosomal RNA gene of the chlamydia-like bacterium associated with gill disease, epitheliocystis, in farmed Atlantic salmon. In addition successfully obtained a partial segment of the gene from the bacterium infecting farmed Arctic char.

c. Source of Federal Funds – Hatch

d. Scope of Impact – 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 animal species. To try to understand the origins of a communicable bacterium or virus, families with multiple cases of Crohn's disease have been the subject of investigation.

b. Impact – This study makes 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. If the findings recorded here 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 – State

Key Theme - Protein Modeling and Biotechnology

a. Activity – Much of the public, including students in secondary school as well as undergraduate students, perceives agricultural biotechnology as either animal cloning, or genetic engineering of plants. However, use of molecular genetics, bioinformatics, and other tools of 'biotechnology' have the ability to inform and educate all of us; scientists, the public, and 'stakeholders' alike, in the area of how humans affect the biological world and how the environment affects humans. The focus of the effort is to educate citizen groups, students, teachers, etc. about how molecular biology provides the tools to gain an insight into how protein structure is related to protein function, and how an understanding of protein functions provides a basis to improve the quality of life.

b. Impact – Secondary school teachers were educated about how important an understanding of protein function is to insights in all fields of biology. Legislators were educated about the power of biotechnology to enhance quality of life for all citizens. Linkages were developed with several local secondary schools.

c. Source of Federal Funds – Smith-Lever

d. Scope of Impact – State

Key Theme – Dairy Production Management

a. Activity – Mastitis is the most costly disease to animal agriculture in the U.S. One of the greatest challenges facing dairy farmers today is successfully managing high producing cows for diseases such as mastitis during the transition period. While there have been great improvements in mastitis prevention and control, there are still large gaps in the knowledge of this complex problem. A greater understanding of the intimate relationship between body condition, negative energy balance, the immune system, and periparturient diseases such as mastitis will allow for the development of better management practices and the potential to develop intervention strategies that reduce the need for antibiotic use on dairy farms. The goal of this research project is to analyze the relationship between negative energy balance, ketosis, immune system function and mastitis during the transition period in high producing dairy cows.

b. Impact – The results from this study will be used for mid-term development of Extension programs to disseminate information on management practices to promote animal health and reduce mastitis.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Non-Commercial Poultry Rearing/ Youth Poultry Projects

a. Activity - Chickens, ducks, turkeys, geese, gamebirds and other fancy fowl are reared for non-commercial use in New England. In the spring of 2005, an average of 8,145 baby chicks (meat type, layer type and fancy fowl) were being 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. One new health regulation adopted in June, 2005, required the testing of all birds going to shows, within as well as outside of CT, for Pullorum as well as Avian Influenza. This meant that small flock owners needed to be educated about this testing program. There are more than 50 adult volunteer leaders that helped in the 4-H poultry projects and another 83 or more schoolteachers involved indirectly through incubation and embryology projects. Two small poultry flock web sites (http://web.uconn.edu/poultry/4-hpoultry and http://web.uconn.edu/poultry/poultrypages) were updated.

b. Impact – 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 2 years. As more youth become involved, more networking is occurring and more become interested. 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. This increased profitability to businesses carries through to other products for poultry rearing. By educating youth and small poultry flock owners we are helping to maintain a viable section of the economy is being maintained while reducing the threat of spreading potentially deadly diseases.

c. Source of Federal Funds – Smith-Lever

d. Scope of Impact – State

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 they are allowed to study in the classroom. Chick embryos are still one of the species allowed for live study, along with some amphibians and invertebrates. Project focus was on raising teachers' interest in chick incubation and embryology projects they can perform within their classrooms. The main objective is to increase student interest in biological/animal science by introducing an exciting project early in their educational experience. A web site from UConn is available for teachers and students at http://web.uconn.edu/poultry/4-hpoultry. Teachers were taught the basics of managing a classroom incubator and concepts of embryology.

b. Impacts - Students exposed to incubation and embryology programs early in their educational experience are more open to rearing poultry as a 4-H project and as an adult.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme – Aquaculture Species for Culture and New Gear Technology

a. Activity - Industry - Extension Partnered Research Projects (IEPRPs) are pilot-scale feasibility studies that may lead to comprehensive proposals involving commercial-scale research. IEPRPs were initiated in an effort to diversify the aquaculture products cultivated in Connecticut. In addition to the potential economic benefit provided by these new industries, an added benefit would be to alleviate fishing pressure on traditional species. In essence, the Extension educator brings the "science" into the field, while the industry member uses his field experience to predict how experiments will work in field conditions. Following the completion of the projects, results are disseminated to a variety of stakeholders.

b. Impact - As a direct result of dissemination of the project results, several industry members have become interested in farming mussels, and also using long line technology in Long Island Sound. The long line study also allowed "pre-test" of the new permitting process for aquaculture structures in LIS.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - Crop Insurance and Risk Management

a. Activity – There is a need to improve the viability and profitability of Connecticut agricultural enterprises. The overall objective of this project is to improve the viability and financial health of Connecticut agricultural producers through crop insurance and risk management education. A series of crop insurance and risk management education sessions were developed and delivered

for Connecticut producers and their advisors. A new output was development of a website entitled: "Connecticut Farm Risk Management and Crop Insurance" (www.canr.uconn.edu/ces/frm).

b. Impact – Connecticut agricultural producers increased their viability and 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 Connecticut Farm Risk Management and Crop Insurance website and periodic mailings are continuing to keep Connecticut producers and agribusiness professionals up-to-date on the latest information on these and other topics.

c. Source of Federal Funds – Smith-Lever

d. Scope of Impact – State

Key Theme - New England Fluid Milk Marketing

a. Activity - Survey results indicate that there continues to be a persistent exercise of market power in the channel by supermarket retailers in New England. Research generated considerable interest in milk pricing questions in several state houses and also at the federal level. Extension programming focused on providing information on the milk pricing problem and testifying before legislative bodies. Research assistance was provided to the Connecticut Legislature to aid them in the reformation and expansion of the State Milk Regulation Board. The Board's expanded duties will include economic regulatory actions as well as health and sanitary regulations. Go to www.fmpc.uconn.edu and click on "Milk Price Gouging" to access many research and analysis pieces. During the past year another regional milk price check was completed.

b. Impact – A significant outcome from the research and involvement in the public policy process is the documented need for continued research on milk pricing and state and federal dairy policy initiatives. The Connecticut Legislature considered three bills to reform milk pricing. They were Connecticut House bill no. 5573 "An Act Concerning the Milk Regulation Brand and a Study of the Connecticut Dairy Industry", Connecticut House bill no. 6907 "An Act Concerning the Revision and Modernization of Milk Regulation" and Substitute Senate Bill No. 1361, "An Act Concerning Southern New England Milk Pricing."

c. Source of Federal Funds – Smith-Lever, Hatch

d. Scope of Impact – State

Key Theme - Risk Analysis and Government Policy for Genetically Modified (GM) Crops

a. Activity – The United States has led the world in the adoption of genetically modified (GM) crops and has the largest number of acres of GM food and fiber crops with over 80% of the soybeans expressing a transgene. Since the 1980's, biotechnology companies, United States government regulators, politicians, university scientists and farmers have had complex and intersecting roles in the commercialization of specific GM crops. The process of risk analysis could play a role in predicting the risks and benefits of each GM crop to human health and the

environment. Scientific information that underlies the risk analysis is part of the regulatory review process. Research focused on: 1) risk assessment techniques to predict the impact of GM crops on the environment with emphasis on GM turfgrasses, 2) comparison of transparency in ecological risk assessment and regulation of GM crops in the US and Australia, and 3) ongoing study of US regulation and risk assessment of GM crops.

b. Impact – Research on risk analysis and regulation supports better decision making at the local, state and national level. Participation in various conferences or workshops on science policy, ecological risk assessment, biosafety and related topics, including four lectures on risk assessment and regulation for GM crops will enhance such decision-making processes. This is a short term outcome.

c. Source of Federal Funds –Smith-Lever, Hatch

d. Scope of Impact – State

Key Theme - Turfgrass

a. Activity - The Turfgrass industry in the state of Connecticut encompasses many areas of expertise including sod production, golf courses, athletic fields, residential and commercial lawn care, cemeteries, parks, schools and municipalities. Continuing education to the green industry was designed to aid in allowing managers to obtain the highest quality turf while not negatively impacting the environment. This past year the Connecticut Grounds Keepers held their fourth Certified Landscape Technician Test at the University of Connecticut Teaching and Research Facility. Presentations to industry organizations and the general public reached approximately 732 Connecticut citizens.

b. Impact - The visibility of the turfgrass program continues to be on the rise. Manufacturers of equipment have donated or placed on loan to the Turfgrass Science Program equipment that is to be used for teaching and research valued at $24,000.
Students gained experience as well as the opportunity to network with many leaders of the Connecticut turfgrass profession. This is a short term outcome.

c. Source of Federal Funds –Smith-Lever, Hatch

d. Scope of Impact – State

Key Theme - Turfgrass Pathology Program.

a. Activity - The goal of the turfgrass pathology research program is to work in collaboration with other regional Universities such as URI, UMASS, Cornell, and Rutgers to further increase the information base with regards to managing chronic and newly emerging turf diseases. 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.

b. Impacts - Opened in the April 2005, the UConn Turfgrass Disease Diagnostic Center has assisted commercial turfgrass managers from Connecticut, Maine, Massachusetts, New Hampshire, New York and Vermont. One hundred percent (100%) of all samples received by the Center have been completed with 24 hours; 50% of the diagnoses were returned to the client the same day they arrived. A rapid diagnosis is essential for turfgrass managers to quickly and accurately select the most appropriate control measure for the situation. Contributions totaling $18,500 have been provided from industry to assist in the development of the turfgrass pathology research program. The increase in the scope and amount of turfgrass research at UConn has prompted individuals within the turfgrass industry to visit the research farm for the first time. A new website: was established at: www.turf.uconn.edu. This is a short term outcome.

c. Source of Federal Funds –Smith-Lever, Hatch

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 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 2000 cultivars and over 5,000 photographs.

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. The UConn Plant Database receives over 100,000 web page views per day from over 2,000 persons that visit the site each day. 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.

c. Source of Federal Funds – Smith-Lever

d. Scope of Impact – State

Key Theme - Developing Unique and Commercially Valuable Ornamental Plants Through Genetic Engineering

a. Activity - Unique traits that either enhance aesthetic appeal to the consumer, or provide an obvious and direct benefit to the producer, or that enhance the utility of a plant in the landscape have great economic potential in ornamental horticulture. The cytokinin gene, isopentenyl transferase (ipt), was placed under the control of the ACC oxidase promoter from the leaco1 gene from Lycopersicon esculentum and introduced into Nicotiana tabacum (cv. Havana) and chrysanthemum (Dendranthema x grandiflorum `Iridon').

b. Impacts - Filed one provisional patent on the leaco-ipt technology, published four peer-reviewed journal articles, published six peer-reviewed abstracts and presented five research seminars at national meetings or as invited speaker to scientific audiences. This is a medium outcome.

c. Source of Federal Funds – Smith-Lever

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 applied 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 even here on Earth. A lay article about the research, “Farming in Space,” appeared in the November 2004 issue of Highlights for Children. Highlights for Children is a general interest, non-sectarian educational magazine for children aged preschool to preteen with a circulation of between 2 and 2.5 million copies per month and maybe twice that readership. One journal article was published in a refereed journal, and two others were accepted for publication. Two presentations were made at a national professional meeting in addition to one invited seminar attended by 40 people and simultaneously webcast to others.

b. Impacts - Following our procedures, researchers are now able to consistently achieve seed production in microgravity. This work supports the President’s Space Exploration Initiative by making possible the production of seeds during future long duration space missions. 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. Sub-optimal seed maturation has been linked to yield losses in economically important crops such as canola and soybean. Post-harvest losses are a problem for a variety of

commodities, including such major crops as apples and bananas. Many of these losses can be linked to anomalies within the micro-environment of the maturing fruit, particularly in the balance of metabolic gasses in its internal atmosphere. By elucidating the role of these endogenous gases, especially oxygen and ethylene, agriculture and industry have basic information needed to devise strategies to mitigate these losses.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Woody Landscape Plants
a. Activity - Research focused on evaluation of woody landscape plants for use in Connecticut. Evaluation of woody plant material includes determining adaptability, establishing methods of propagation, and studying methods of production in the nursery.

b. Impacts – Research begun 20 years ago to study methods of propagation and production (both in the field and in the container) of *Microbiota decussata* provided many growers with stock plants. In the past 5 years the plant has become a popular landscape item to the point that demand presently exceeds production. Recognition of this popularity is demonstrated with the plant's inclusion in Summerhill Nursery's publication *The Plants We Grow*.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Bilingual Extension 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. Many of these workers are likely to be non-English speakers. A survey of vegetable producers, tobacco growers, greenhouse and nursery managers, golf course superintendents, grounds keepers, landscape maintenance operations, orchard managers, Christmas trees growers and small fruit growers has been completed.

b. Impacts - 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

d. Scope of Impact – State

Key Theme - Effective Use of Microbial Inoculants
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 because they must be applied prior to any incidence of

disease and it is impossible to determine if the microbes persist in the potting mix or colonize roots. Growers will even go so far as to incorporate MI in their potting mix and apply preventative fungicide as well. The focus of this research is to evaluate the persistence and proliferation of MI in potting mixes and on plant roots.

b. Impact – Results indicate the need for more definitive methods for identifying microbes when members of the same genus are present in the potting mix. Results showed that the microbes persisted in the potting mix and colonized roots throughout the production cycle. However, conventional techniques relying on selective culture media to enumerate microbes do not provide unequivocal identification of specific inoculants.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Dissecting the Role of the H^+-PPase AVP1 in Plant Growth, Nutrition, and Response to Abiotic Stress

a. Activity - Cells expend as much as 50% of their total intracellular energy reserves to maintain gradients of ions across their membranes. The electrochemical potential of these ion gradients represents stored energy. It is well documented that plant and animal cells evolved in fresh water and sea water, respectively, and developed the ion pumps best suited for these environments. The research objective is to evaluate how altering the formation of proton gradients affects plant growth and development under normal and stress conditions (i.e., drought or salinity).

b. Impact – Results demonstrated that H^+-PPase AVP1 plays a critical role in facilitating auxin transport and thereby coordinating development. AVP1 overexpression resulted in enhanced cell divisions at the onset of organ formation, hyperplasia, and increased auxin transport. This research will have a positive impact on agricultural production, helping to meet the challenge of world hunger. Additionally, this research will shed light on our understanding of key chemiosmotic mechanisms involved in the regulation of plant growth and development.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Sustainable Agriculture Vegetable Crops

a. Activity –The objective of this program is to provide 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. 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.

b. Impact –Northeast food producers were trained in reduced-risk methods that helped them preserve environmental quality, keep vegetables free of illegal pesticide residues, and maintain farm profitability and open space. Of the 55 growers who returned evaluations of the Annual CT Vegetable and Small Fruit Conference 100% rated the educational program as excellent or good, 96% said that it would result in improvements in their crop production and marketing practices, 100% said it would improve their pest management and/or crop quality, 81% said it would improve their farms' environmental quality, 76% said it would improve their farm profitability, and 64% said they would adopt new practices as a result of attending the conference. The 13 growers that participated in the full-season IPM & Perimeter Trap Cropping field training programs reduced the number of pesticide applications they made to 298.5 acres of sweet corn, peppers and cucurbits (summer squash, winter squash and cucumbers) by 22% and the amount of active ingredient they used by 2.6 pounds of A.I./acre or 51%. They increased their crop yields by 12%, 12%, and 18% on sweet corn, peppers, and cucurbits respectively, and saved $184,705 ($619/acre) by reducing pest damage.

c. Source of Federal Funds – Smith-Lever

d. Scope of Impact – State

Key Theme - Perimeter Trap Crop System for Cucurbit Pests

a. Activity – A recently released U. S. General Accounting Office Report on IPM criticized IPM programs for relying too much on chemical solutions and noted the low adoption rate of biologically-based pest control tactics, which have great potential to reduce the use of pesticides and their associated environmental and human health risks. Perimeter trap cropping (PTC) involves planting a highly attractive plant so that it completely encircles and protects the cash crop like fortress walls. Efficacy can often be improved by supplementing the trap crop with other biological, mechanical, cultural or chemical control tactics or with pest attractants or repellants. The PTC system functions by concentrating and/or controlling the pest population in the border area of a field, while natural enemies in the center are spared to help provide season-long pest control on the cash crop. Research efforts focused on controlling the striped cucumber beetle on summer squash, cucumbers, and butternut squash because this pest can reduce or destroy plant stands or vector bacterial wilt disease to these popular crops, which are produced on most Northeast vegetable farms. In addition, the broad-spectrum insecticides that are commonly used to control this pest may cause secondary pest outbreaks (e.g. aphids, mites, etc.) and result in additional pesticide applications.

b. Impacts - Educators in CT & MA developed and popularized perimeter trap crop systems for cucurbits that provide equal or better pest control efficacy than conventional multiple-full-field-spray systems. The perimeter trap crop treatment reduced cucumber beetle numbers and defoliation compared to control plots in both summer squash and butternut squash experiments. Management of beetles and damage was comparable to plots sprayed on a regular basis. Ten growers that were surveyed reduced their insecticide use by 96% (1.8 lbs. A.I./acre) on 153 acres where PTC was used. These same growers saved 18% of their crop from damage by the cucumber beetle on 96 acres of squash and cucumbers by using PTC. Increased yields produced additional gross income of $105,930 ($1,100/acre).

c. Source of Federal Funds – Smith-Lever

d. Scope of Impact – Region (CT, MA)

Key Theme - Master Gardener Program

a. Activity – There is a strong public support action 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 – Master Gardeners volunteered over 5,700 office hours and made 5,491 in-office contacts with members of the public via, telephone, mail and walk ins resulting in diagnosis of over 2,146 different plant problems (insects, plant ID, etc). Additionally, Master Gardeners volunteered over 7,000 hours in a variety of community settings that involved 131 outreach projects in the areas of urban and community horticulture, and historical and sustainable landscapes. 28 Advanced Master Gardeners volunteered over 8,500 hours in a variety of community settings.

c. Source of Federal Funds – Smith-Lever

d. Scope of Impact – State

Key Theme –Urban Gardening

a. Activity – The urban gardening program focuses on the empowerment of the limited-income people by giving them the opportunity to grow part of their own food in an inner-city environment. Bridgeport is one of the poorest cities in the nation. Considerable efforts are directed toward establishing and maintaining strong working relationships with the local government, local agencies, community leaders and other organizations and institutions. Educational methods include demonstration gardens, hands on experience, group lecturing and individual or one-on-one consultations.

b. Impact – Gardeners are using less chemical products, are better gardeners due to basic gardening knowledge gained such as what kind of plants to grow and when to grow, how to combat pests, and how to grow and care vegetables. 16 community gardens have been cleaned up, fenced, furnished with topsoil and planted, benefiting more than 500 individuals.

c. Source of Federal Funds – Smith-Lever

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.

A distance education course in food safety, developed for food service personnel, http://www.team.uconn.edu/foodsafety_course/index.htm, was tested with 50 subjects finding that distance education was as effective as traditional education.

Extension and research efforts in the Hazard Analysis Critical Control Point (HACCP) systems saw cheesemakers and other producers completing prerequisite programs to develop HACCP programs.

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	0.90	1.35
Hatch	-	-
Multi-state research	-	-
State funds	7.35	9.65
Competitive grants	-	-
Animal health	-	-
Total	659,278	8.25

Key Theme - Food Safety for Farmstead Cheese Makers in New England

a. Activity – Cheese was originally developed as a means of preserving raw milk in times of excess production and is generally considered to be a relatively 'safe' food. However, there have been several reported cheese-associated outbreaks of foodborne illness. Cheeses made with unpasteurized milk appear involved in the majority of reported outbreaks. It is recognized that in cheese manufacture, post-pasteurization contamination can occur. There are concerns that subpasteurization temperatures might create pathogenic bacteria that are resistant to the acids developed during the aging of raw milk cheese. This means that they would survive the aging process and increase the risk for illness. Research was conducted to determine if acid tolerance is likely to occur.

b. Impact - Research results indicate that there is reason to believe that subpasteurization temperatures may be a way for artisanal makers of unpasteurized milk cheeses to reduce the risk that pathogens are present in their cheeses while not affecting the indigenous, though not pathogenic, bacteria that contribute to the unique characteristics of aged, unpasteurized farmstead cheeses, especially flavor. These two studies could lead to the development of safer raw milk cheeses using a method that can destroy pathogenic bacteria while allowing the desired flavor-making bacteria to survive.

c. Source of Federal Funds –Hatch

d. Scope of Impact - State

Key Theme - Food Safety for Farmstead Cheese Makers in New England
a. Activity – Cheese making is a New England tradition. New England cheese products are widely distributed at fine retail establishments throughout the region and nationwide. There have been several reported cheese-associated outbreaks of foodborne illness. Cheeses made with unpasteurized milk appear involved in the majority of reported outbreaks. It is recognized that in cheese manufacturing, post-pasteurization contamination can occur. The education project is focused on helping cheesemakers to increase their adoption of recommended food handling practices as it pertains to cheese; to use HACCP-based approaches to cheese manufacturing practices and processes and to increase their knowledge of risks and responsible practices in relation to cheese and microbial contamination. The target audience includes farmstead and artisanal cheesemakers in New England, including state regulators responsible for the cheese industry, and those considering a food processing business.

b. Impact – Impacts of this project have been hindered by the fact that most farmstead cheesemakers are small operations with fewer than 5 employees. This makes it difficult to dedicate time to food safety training and plan development. Five of eleven farmstead cheesemakers have completed the development of their HACCP plans, completing all seven HACCP steps. The models developed are now available for use by farmstead cheesemakers throughout New England.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - HACCP Education for New England Food Industry
a. Activity – In the United States, an estimated 76 million individuals contract foodborne, illnesses each year. The National Center for Health Statistics estimates the number of deaths per year from foodborne illness to be 9,100. To address the presence of food safety hazards in the food system, Hazard Analysis Critical Control Point (HACCP) systems have become the food safety system of choice for the food processing industry and the system by regulation for the meat and poultry, seafood, and juice industries.
Opportunities for HACCP training in New England are very limited. The small food processing operations which characterize most NE processors, cannot afford (due to time and/or fiscal restraints) to travel to the Midwest or South to take advantage of other courses. UConn Cooperative Extension System has coordinated and/or participated in HACCP training efforts for seafood, meat and poultry since 1997. UConn is the only Extension program in New England offering courses for meat and poultry processors and for the juice/cider industry. Participants in the training programs gain the skills needed to develop a HACCP plan so that they are in compliance with the regulations.
b. Impact – All retail cider processors reported that the workshop met their expectations as they increased knowledge about key practices, reported behaviors they plan to change and additional practices to employ. Respondents indicated that as a result of attending this program, they

would develop a better sanitation program, do more training of employees, monitor employee sanitation, conduct better record keeping and monitoring of the process, and put in a hand wash station. All meat and participants indicated that they learned something or realized something new as a result of the workshop and all planned to use the material learned to develop their HACCP plans as required by the USDA. All juice participants indicated that they learned/realized something new and that they were prepared to write a HACCP plan, with 57 participants are now prepared to meet the requirements of the Juice HACCP regulation. This is a medium outcome.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – New England

Key Theme - Seafood Safety

a. Activity – In 1996, pending FDA regulation governing the safe processing and handling of fish and fishery products, including a requirement that all seafood processors process their seafood following HACCP (Hazard Analysis and Critical Control Point) principles, prompted the establishment of a seafood safety extension program. The regulation calls for all processors to meet a HACCP training requirement, which involves taking a course developed by the Seafood HACCP Alliance, a group of academics, regulators, and industry members. The training requirement in the FDA regulation requires on-going access to the training courses, because of the employee turnover in the seafood industry. Individual course evaluations are conducted, using the prescribed AFDO evaluation form, that focuses on ranking the various chapters in the training manual and the hazards and control guide for seafood, the two major resources used for the course.

b. Impact – The seafood safety extension program has enabled numerous seafood businesses in Connecticut and other parts of southern New England to remain in business by providing the training required by FDA locally, at a low cost, and on a regular basis. The rank for the various chapters in the training manual run average between fair (3) and excellent (1). The hazards guide consistently ranks high, between 2 and 1 overall. The hands-on, model HACCP plan development part of the course also ranks consistently very high, receiving mostly scores of "Excellent".

c. Source of Federal Funds – Smith-Lever

d. Scope of Impact: New England

Goal 3 – A Healthy, Well-Nourished Population

The Connecticut program was particularly 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.

Docosahexaenoic acid (DHA) research designed to assess the role of foods with DHA on sleep patterns of newborns demonstrated that infants born to women with gestational diabetes mellitus (GDM) have a less mature central nervous system (CNS). There has been broad interest internationally since the data provides the basis for exploring mechanisms and intervention

Research on the effects of exercise on protein utilization in healthy, non-obese children versus obese children was conducted. Results will help to characterize the relationship between energy intake and protein metabolism in obese and non-obese children, thereby providing for the development of guidelines for management of pediatric obesity.

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.

The CT Team Nutrition Healthy Vending project saw over 6000 Connecticut students choosing healthy beverages and snacks at school, with the nutrition standards and allowable food list developed being used as a basis for statewide legislation for all public schools ("An Act Concerning School Nutrition Bill 1309"). As a result over 40,000 students from 10 school districts are benefiting from newly developed nutrition and physical activity policies in their town and schools.

Husky Nutrition Program that works with parents and families to solve nutrition-related anemia among children in Hartford resulted in increased awareness of providers and caretakers of the problem, development of a statewide coalition, and re-evaluation of delivery of Women Infant Children (WIC) Service by the Hartford Health Department. Results from the breastfeeding peer counseling trials led the WIC program to provide additional funding for expanding HFNP's breastfeeding peer counseling program. Every dollar invested on this breastfeeding peer counseling program is likely to return $4.60 in saving. The state could have annual net savings of up to $6.9 million per year if program is expanded to all low-income women served by the WIC program.

Benefits to clientele and stakeholders who participated in this goal area were many; including improved opportunities for newborn infants, and better knowledge of nutrition needs by low income inner-city residents.

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	346,334	7.08
Hatch	-	-
Multi-state research	-	-
State funds	1,048,970	13.63
Competitive grants	405,236	9.79
Animal health	-	-
Total	1,766,254	30.50

Key Theme - Impact of a DHA-Functional Food During Pregnancy on Infant Neurobehavioral Development

a. Activity - The objective of this project is to define the benefit to infant brain development of increasing DHA, a fat found in cold-water marine fish, in the diets of pregnant women. Previously it has been documented that women of child-bearing age are consuming amounts of DHA that are much lower than what has been recommended for fetal development. These findings are important to nutrition recommendations and policies for women of child-bearing age and pregnant women.

b. Impacts - There appears to be a relationship between behavior right after birth and temperament (an aspect of personality) at 6 months. This finding is important because it points to a benefit of the DHA which is likely maintained out to at least 6 months of age. The literature is beginning to provide information on the benefits of prenatal supplementation with DHA and food industries and clinicians are responding by putting products in the markets and by recommending that pregnant women consume supplements providing DHA. Nestec, Inc has licensed another food company to make DHA bars for the market with these results being an important marketing tool for those bars which will likely be on market shelves early 2006.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Weight Loss and Coronary Heart Disease Risk

a. Activity - Obesity adversely affects morbidity and mortality. At least 40 % of the population in the U.S. is currently overweight and many have co-morbid conditions including hypertension, diabetes, lipid disorders, and coronary heart disease (CHD). The American College of Cardiology has recently stated that the scientific evidence is now overwhelming demonstrating that obesity alone is an independent risk factor for CHD. A body mass index (BMI) between 25 and 30 kg/m^2 increases the risk of fatal or non-fatal myocardial infarction in men by 72%. In women, the risk of fatal and non-fatal myocardial infarction is increased by 42% even at a BMI of 23 to 25 kg/m and mortality risk increases exponentially above these BMI levels.

b. Impact - The research project emphasized the importance of healthy diets and increased activity in maintaining body weight. Following a 10-week intervention, subjects who participated in this study had significant decreases in plasma cholesterol and triglycerides and increases in HDL cholesterol (the good cholesterol) compared to baseline. Participants also presented significant

decrease in body fat mass, insulin and leptin. All these changes in plasma lipids, hormones and body composition result in a healthier profile associated with decreased risk for coronary heart disease.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Cardioprotective Effects of Grape Polyphenos in Pre- and Post-menopausal Women

a. Activity- Antioxidants present in grapes may have an important role in reducing coronary heart disease risk. Oxidized LDL has been associated with increased atherosclerotic lesions. The oxidation of LDL probably takes place in the arterial wall where LDL particles result in lipid deposition and lesion involvement. Therefore grapes have the potential to decrease atherosclerotic lesions by retarding the oxidation process of LDL. Menopause is associated with increased risk for heart disease due to elevated plasma LDL cholesterol and triglycerides, which have been associated with age and lack of estrogen. It has also been demonstrated that after menopause LDL may have increased susceptibility to oxidation.

b. Impact - The inclusion of fruits and vegetables rich in polyphenols (antioxidants) to the diets of postmenopausal women may help to reverse hyperlipidemia and alter the atherogenicity of the LDL particles.

Key Theme - Hypocholesterolemic Action of Green Tea Extracts

a. Activity - Evidence suggests that green tea or its catechins may lower the blood levels of cholesterol and retard the development or progression of atherosclerosis in animal models. At present, how green tea or its bioactive components (catechins) influence cholesterol metabolism is unknown. Furthermore, little information exists on whether green tea can effectively prevent the postmenopausal increases in blood cholesterol and other lipids. This project focuses on evaluating the efficacy of green tea extract (GTE) and its active compounds (catechins) in inhibiting the intestinal absorption of cholesterol and the liver synthesis and release of cholesterol into the blood circulation and excretion of cholesterol via bile.

b. Impacts - Data showed that green tea in drinking water at moderate doses significantly lowered the plasma level of triglyceride in the animals fed a diet containing cholesterol. Data also showed that green tea drastically inhibits the intestinal absorption of fat and cholesterol. Because the elevated levels of blood lipids is an independent risk factor for coronary heart disease, this finding suggests that green tea could be recommended for those at high risk such as postmenopausal women with the metabolic syndrome, type-2 diabetes, and/or hypertriglyceridemia.. However, green tea consumption may help reduce risk for coronary heart disease and 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 - Low Carbohydrate Diets and Diabetes

a. Activity - Low carbohydrate diets may be beneficial for those individuals who have the metabolic syndrome (high plasma triglycerides, low HDL, high blood glucose, hypertension and abdominal obesity). Recently a significant number of studies on very low-carbohydrate diets (VLCD) have, in general, pointed to carbohydrate restriction as a very effective option for losing weight. However, most professional organizations continue to discourage VLCD because they contradict low-fat diets. The incorporation of soluble fiber to a habitual diet has been consistently shown to improve fasting total cholesterol and LDL-C by interfering with cholesterol absorption and/or enhancing biliary cholesterol excretion. However many of these individuals also have high plasma triglycerides and low HDL, which are associated with an increase risk for cardiovascular disease.

b. Impacts - Low fat diets do not have a major impact on plasma triglycerides and do tend to decrease HDL even more. There is concern that low carbohydrate diets increase LDL. The inclusion of dietary fiber may solve this problem.

c. Source of Federal Funds – Hatch

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 factors in our diets influence our lipoprotein profile and reduce the risk factors for CVD.

b. Impacts - 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. 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 – Vitamin A/PEPCK

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 seeks to further define the numerous effects of vitamin A on gene expression by examining a specific model gene, that encoding phosphoenolpyruvate carboxykinase (PEPCK). The PEPCK gene was one of the first metabolic genes to be isolated; therefore, it serves as a model in the study of genes involved in carbohydrate metabolism.

b. Impact - Results indicate that a number of genes involved in carbohydrate and lipid metabolism require adequate vitamin for normal expression, and lipid metabolism is significantly disrupted with vitamin A deficiency. Furthermore, cell adhesion and the overall structure of the liver itself are disturbed with vitamin A deficiency. Overall, 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 our understanding of the role of vitamin A in the metabolic dysfunction that occurs in type 2 diabetes, metabolic syndrome, and obesity.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Exercise Training and Protein Utilization in Healthy Men and Women

a. Activity - National health objectives continue to focus on the need to increase routine physically activity in the lives of adults. The availability of new scientific techniques combined with improved efforts to conduct diet interventions provides the opportunity to better define the affect of routine aerobic exercise on nutrient needs. In particular, the ability to correctly balance calorie intake with energy expenditure for optimal use of dietary protein is important to long term health and weight maintenance. Measurements of skeletal muscle metabolism along with whole body protein turnover are needed to fully characterize protein utilization in healthy men and women who participate in routine aerobic exercise.

b. Impact - Results suggest that the current Recommended Dietary Allowance (RDA) is likely insufficient to maintain rates of protein utilization in men and women who routinely participate in aerobic exercise when sufficient calories are consumed for weight maintenance. While this work further substantiates the importance of good dietary control when studies are specifically directed at protein utilization given a number of different exercise interventions, long term implications point to the need to further evaluate the recently released Dietary Reference Intakes (DRIs) in the context of active lifestyles across the lifespan.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Food Security and Nutrition Education

a. Activity - Recent data collected by USDA indicates that about 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. Poverty increased by 0.4% from 2001-2003, up to 8% of all residents. 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 increased. 26% of all young children in Connecticut live in low-income families and between 30% and 47% of the children in the major cities live in poverty. Adult obesity increased in Connecticut from 10.9% in 1991 to 17.3% in 2001 and 18.2% in 2003. Over 55% of all Connecticut adults are considered overweight. For 35 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. Poor nutrition can lead to higher rates of infant mortality, low birth weight infants, learning disabilities, school absenteeism, compromised immunity, chronic diseases and hunger.

b. Impact - Behavior checklists revealed that after EFNEP series completion, homemakers planned more meals in advance, ran out of food less often, read food labels, used less salt in food preparation and used better food safety techniques. As a State, 92% of participants showed positive changes in dietary choices and habits.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme - Connecticut Team Nutrition

a. Activity - The Centers for Disease Control (CDC) and other national health organizations have identified childhood obesity as a national epidemic. Connecticut Team Nutrition has been working towards the mission of improving school health and positively impacting children's nutritional status by promoting a healthy school nutrition environment for Connecticut's schools through Healthy Snack Pilot project, the Nutrition Policies project, Connecticut at PLAY, and Promoting Healthy Eating and Physical Activity for Early Childcare Providers: A Distance Education Course. Connecticut at PLAY! Upon completion of the pilot project a Healthy Snack Action Guide will be developed to assist all Connecticut schools with implementing healthy snack food choices. The Healthy Vending project reached five pilot schools and approximately 6000 students. The Nutrition Policies project is currently underway with 10 Connecticut school districts. Selected pilots will serve as best practice models for other schools in developing local policies. Connecticut at PLAY reached 100,000 students representing over 100 schools. The course is described on-line nationally on USDA's Team Nutrition Website.

b. Impacts - As a result of the CT Team Nutrition Healthy Vending project, over 6000 Connecticut students are choosing healthy beverages and snacks at school, and the nutrition standards and allowable food list developed is being used as a basis for statewide legislation for all public schools ("An Act Concerning School Nutrition Bill 1309"). As a result of the CT Team Nutrition "Nutrition Policies" project, over 40,000 students from 10 school districts are benefiting from newly developed nutrition and physical activity policies in their town and schools. As a result of Connecticut at PLAY, over 100,000 Connecticut students spent the month of April 2005 becoming more physically active at school and at home.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme - Prevent, Treat and Minimize the Consequences of Childhood Iron-deficiency Anemia and Childhood Overweight

a. Activity - The Husky Nutrition Program works with families to solve nutrition related problems. The two major foci of our work are the reduction of childhood anemia and the reduction of childhood overweight in the city of Hartford. Hartford CT is the second poorest midsize city in the U.S. with a child poverty rate of 41%. Hartford's children under the age of 18

are 40.8% Black, primarily African-American and West Indian, and 51.5% Hispanic, primarily Puerto Rican and Dominican, but several other cultures are represented as well. Research in this community has demonstrated that parents are well aware of the high occurrence of anemia, but are not focused on prevention.

b. Impacts – Impacts include on increased recognition and receptiveness of Husky Reads program among children, providers and caretakers; enhanced knowledge among caretakers regarding the problem; development of a state-wide, Hartford-focused coalition; and enhancement of services by Women, Infants and Children (WIC) nutritionists with the Hartford Health Department. Consistent and dependable presence at one community site motivated the director to focus on nutrition for her 15-week summer session for preschoolers and an after-school program for adolescents.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme - Senior Nutrition Awareness Project, SNAP

a. Activity - Southeastern Connecticut's senior population faces complex issues affecting their nutritional status. Relocation from a home to a senior housing site, loss of a spouse, changes in health status, reduced functional ability and independence, transportation and food access issues, and insufficient income are some of the many factors that have a negative impact on nutrition. Assessment of the nutrition needs and issues related to optimal nutrition for SNAP clients indicate that this group is similar to other national samples of elderly (CSFII data). As with the national sample, SNAP clients are consuming sub-optimal amounts of fiber, calcium, B-12, and carotenoids, as well as many other key nutrients. In addition, these older adults suffer from multiple chronic health conditions that often result from over consumption of calories. However, underweight has also been detected as a serious indicator of risk for almost 25% of these SNAP clients. The heterogeneity of the older population with regard to health status, functional ability and medical nutrition regimens, require that nutrition education and information be tailored to the specific needs of many sub-groups within the population.

b. Impacts - After attending food safety programs, seniors have stated they threw away outdated foods in the freezer, refrigerator, and pantry. Also, non-usable containers were discarded. Seniors have commented on how informative and helpful the information is after participating in programs. The social service provider stated the programs have had a positive impact on the children helping them make some better food choices.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme -Connecticut Food Policy Council

a. Activity - In the past year or so, there has been increased national focus on the problems of obesity in children and adults. Several pieces of legislation have been initiated to address some of the problems, both in Connecticut and at the federal level. At the same time, USDA and HHS released the 2005 Dietary Guidelines for Americans and most recently, the new version of the food guide pyramid, MyPyramid. The convergence of these issues and events have put food and

nutrition in the limelight and heightened awareness of the need for nutrition education. However, programs such as EFNEP – with a proven record of success – do not have the recognition, support and funding levels required to meet the needs. Collaboration and coordination of federal, state and local/private nutrition education programs is essential in order to show success at changing behavior and having an impact on nutrition problems. The Connecticut Food Policy Council (CFPC) nutrition education subcommittee developed a publication, "What's Cooking in Connecticut Schools," highlighting successful school efforts at increasing physical activity, increasing access to locally grown foods, increasing nutrition education and improving the quality of foods served in vending machines, at school events and in the cafeterias. The publication is available on line at www.foodpc.state.ct.us. In addition, a summit, "Nutrition Education: Working Together in Connecticut," was attended by over 175 participants.

b. Impacts – Survey results from the summit - completed by 62 attendees - showed that everyone thought the Summit was very good or outstanding. When asked for "one action or change I plan to make as a result of today's program," 40% stated they would contact their state legislators; 40% said they would become more involved in local school wellness policies and nutrition programs; and the remainder said they would become more active and visible in their communities. Almost 60% of those completing an evaluation signed up to stay involved. This is a short term outcome.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme - Healthy Lifestyles

a. Activity - Physical Activity and Overweight/Obesity are two of the ten leading Health Indicators that have been identified in Healthy People 2010 as major health concerns for the 21st century. There have been exponential rates of overweight and obesity for the U.S., including youth. Over consumption of "super sized meals" and high fat/ high sugar foods and beverages in conjunction with sedentary lifestyles have contributed to this epidemic. Healthy food choices and increased physical activity have been advocated with 4-H programs, including Family Nutrition Program (FNP). 4-H Summer Nutrition Education Program (SYNEP) and 4-H Double Dutch training for 15 youth counselors was conducted using the 4-H Health and Fitness Double Dutch Curriculum. 160 limited resource adults and children were reached by workshops, presentations, and individual counseling offered at multiple sites in the greater Hartford area. Workshops focused on nutrition, exercise and other lifestyle choices to reduce chronic disease and obesity risks. Approximately 1000 caregivers and parents were reached via a statewide newsletter article on child nutrition focusing on increasing diet quality.

b. Impacts - 60% of participants of Nutritional Management of Diabetes workshops were able to make improved food choices for glycemic control and fat intake to reduce cardiovascular risk. 80% of participants were able to access appropriate resources for diet management and physical activity. 90% of participants of a woman's nutrition and healthy lifestyle program went on to have blood work screening for cholesterol, triglyceride, and glucose levels by a nurse. 60% began participation in an on-site exercise program. 75% of parents participating in child nutrition workshops were able to identify dietary and sedentary lifestyle risk factors for the

development of overweight and obesity in their children. Youth Counselors at Waterbury Youth Services stated that they were surprised at their own difficulty in completing the standard challenged by the fitness tests that they engaged in during the training (endurance, flexibility and aerobic activities). Youth counselors stated that they would start to exercise as a result of the training session. This is a short term outcome.

Key Theme - Connecticut Hispanic Family Nutrition Program

a. Activity - With funding from the USDA Food Stamp Program (FSNE), the Connecticut Hispanic Family Nutrition Program (HFNP) was launched in 1995 with an in-depth food security and nutritional diagnosis of Puerto Rican preschoolers in Hartford. Since then, additional needs assessments confirmed that the target groups had serious food insecurity, nutrition- and physical inactivity- related health problems. Furthermore, children's caretakers lacked basic nutrition knowledge and their teachers faced serious obstacles to teach nutrition in the classroom. A culturally competent nutrition education PANA program and five food and nutrition social marketing campaigns were developed. All campaigns have been based on extensive formative research and have been evaluated for process and impact using a pre/post community survey design. These campaigns have concentrated on fruits and vegetables, food access, food safety, breastfeeding, and type 2 diabetes. Campaigns have been highly culturally competent and delivered through major radio, television, and print media Hispanic channels. In addition, campaigns have made extensive use of street billboards and the public mass transit system to deliver their messages.

b. Impacts - These campaigns have covered at least 70% of the target community, with all campaigns able to impact awareness, knowledge and, at least to some extent, behaviors. HFNP is an example of a culturally competent academic-community centered partnership with strong representation from the target community that brings out the best of an academic institution. Data from the January 05-March 2005 HFNP quarterly report shows that the food groups puppet show evaluators ranked the shows as either "good" (12.9%), "very good" (41.9%), or "excellent" (45.2%). None of them classified the show as either "fair" or "poor". All of the teachers said they would recommend the show to a colleague and 96.8% indicated that the nutrition knowledge of the kids increased either "a fair amount" (61.3%) or a lot (35.5%). Two randomized community trials demonstrated the effectiveness of HFNP's peer counseling program at promoting breastfeeding.

Results from the breastfeeding peer counseling trials led the WIC program to provide additional funding for expanding HFNP's breastfeeding peer counseling program. Every dollar invested on this breastfeeding peer counseling program is likely to return $4.60 in saving due to infant morbidity and mortality prevented through this intervention. Current annual savings attributed to HFNP's breastfeeding peer counseling program are $414,000. The state could have annual net savings of up to $6.9 million per year if program is expanded to all low-income women served by the WIC program.

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

Extension education programs for agricultural producers resulted in participating farms reducing their nutrient usage in significant ways through nutrient management planning.

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 statewide invasive species educational web page and 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.

Municipal land use officials participated in an innovative program, 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. Outcomes were many, 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.

Programs were focused on both the national and local level through the nationally acclaimed NEMO program (Nonpoint Education for Municipal Officials). The Network includes 31 programs in 30 states. New NEMO programs were initiated in Hawaii, Arizona, and Illinois. The NEMO Network was featured as an exemplary educational program in the U.S. Commission on Ocean Policy Report, a report commissioned by the President that is meant to serve as a blueprint for protecting the nation's coastal and ocean resources. NEMO Network programs are assisting communities across the nation to better plan and design development. NEMO efforts in Connecticut 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. Putting Communities in Charge has drawn wide praise from a diverse audience, and ten towns have requested workshops and/or assistance related to land use planning and water quality after receiving the publication.

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.

Results from 22 farms who implemented nutrient management plans demonstrated they have at least some excess manure. Results caused the Connecticut Department of Environmental Protection (DEP) to recognize the problem and has commissioned a study to determine feasible alternative uses for manure. The study will look at such things as manure to energy plants, pelletizing as fertilizer, regional composting and other possible uses for manure. DEP recognizes that without an external market for their manure, farms in CT cannot comply with an environmental standard for phosphorus loading on soils.

Benefits to clientele and stakeholders who participated in this goal area were many, including improved public policies at the local and regional level which will enhance wildlife management efforts, improvements in water quality, enhanced agricultural operations that are economically viable and environmentally protective, and more 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	507,734	5.89
Hatch&Mc-Stennis	85,255	0.84
Multi-state research	-	-
State funds	2,589,410	38.72
Competitive grants	616,772	12.98
Animal health	-	-
Total	4,209,171	58.43

Key Theme – Invasive Plants

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. Fruit production studies were conducted as well as seed germination studies and shade tolerance studies.

b. Impact - 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. 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 about $10 million each year for CT growers and landscapers.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme - Influence of plant morphology on the efficacy and intraguild interactions of 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. The sole reliance on chemical tactics is troublesome. For instance, more than 500 insect pests, 270 weed species and 150 plant diseases have become resistant to one or more pesticides (EPA, 1996). 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 sought to understand tritrophic level interactions involving biological control agents. A good understanding of how plant traits influence natural enemies can lead to ways of improving their effectiveness. The objective of the research is to ascertain the effects of plant morphological on two insect predators (the ladybird beetle *Coccinella septempunctata* and the green lacewing *Chrysoperla rufilabris*) commonly used in biological control efforts. Plant morphological traits such as leaf shape or stipule size could modify a predator's total prey consumption, search speed, and dispersal; all of these traits are fundamental to the evaluation of biological control agents. Near-isogenic lines of the garden pea are used for the experiments as pea near-isogenic lines differ only in their leaf morphology due to changes in one to two leaf mutant genes. Previous work had shown that variation in plant morphology can have a significant impact on the effectiveness of coccinellid predators.

b. Activity - Results so far show that coccinellids survive from potential IGP by lacewings in greater proportions when they forage in the most complex plants. Variation in plant morphology influences predator efficacy and it can also influence the frequency of IGP encounters. This research should contribute to our understanding of how plant traits influence biological control agents. The increased understanding of the interaction between plants and insect predators will allow us to better determine 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 – Smith Lever

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. Two biological control tools are being examined: 1) to determine the status in Connecticut of the parasitic wasp *Tiphia vernalis* introduced for control of the Japanese and Oriental beetles; and 2) to examine the efficacy of the entomopathogenic fungus *Metarhizium anisopliae* as a biopesticide against larvae of the Japanese beetle and Oriental beetle. One field trial of *Metarhizium anisopliae* was

completed a second trial is under preparation. The field trial also investigated if method of and timing of application are factors that influence the effectiveness of the biopesticide.

b. Impacts - Research on the efficacy of *Metarhizium anisopliae* will contribute to the development of a biopesticide tool against white grubs. This is a short term outcome.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme - Biological Control of Purple Loosestrife – Beetle Farmer Program

a. Activity - Invasive non-native plants have become a serious concern because they decrease the abundance of native species and reduce biological diversity. Purple loosestrife is an invasive non-native perennial plant that is a serious ecological threat to wetlands in Connecticut. As purple loosestrife takes over wetlands, native plant species are lost and the quality of these important wildlife habitats is reduced. Biological control is recommended as a low-input, sustainable management strategy for purple loosestrife. Galerucella leaf-feeding beetles have been approved by state and federal governments for biological control of purple loosestrife. Feeding injury by the beetles helps to reduce purple loosestrife populations that invade wetlands throughout the United States. Raising beetles to control purple loosestrife is an exciting opportunity for community involvement and for educational outreach for people of all ages - individuals, students and teachers, youth groups, and families. The new beetle farmer has been very popular with participants of purple loosestrife biological control on a regional basis and for those with interest in other invasive plant projects. Participants in the Beetle Farmer program included Connecticut citizens, families, schools, Scouts, and organizations that reared beetles, provided purple loosestrife plants on which to rear the beetles, and/or requested that the beetles be released on their property.

b. Impacts - With the redirection of this program toward public education, greater numbers of volunteers were recruited to learn about the biological control program, rear Galerucella beetles, and release the beneficial insects into local wetlands where purple loosestrife has become invasive and control is desired. 100 new beetle farmers participated in the program. Approximately 300,000 Galerucella beetles were reared and released into 20 new wetland sites overrun with plant purple loosestrife as well as a number of supplemental releases that occurred in previously established locations. Impacts by these biological control agents will become more evident over the next several years as the beetles become established and increase in population.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme - The Connecticut Curriculum for Integrated Pest Management

a. Activity - Through partnerships with Connecticut teachers and other educators, there is an opportunity to increase the knowledge of Connecticut citizens on the principals of Integrated Pest Management (IPM), impacts of IPM on environmental problems and IPM methods that are available to them to restore and preserve the environment. During the third year of a five-year project, IPM curriculum for 7^{th} and 8^{th} grade students was finalized and printed. The curriculum

focuses on various aspects of IPM that include pest identification, (biology of insects, weeds and diseases), pest impacts (economic, ecological and social) and methods of pest control (mechanical, biological, chemical and regulatory). The curriculum is being promoted to middle school science teachers, science supervisors and curriculum specialists, 4-H leaders, and home school families. Partners included Connecticut public school teachers: science coordinators and curriculum specialists. Development of an IPM curriculum for grades K-1 and 2-3 is also underway.

b. Impact - As teachers and other educators learn about the new IPM curriculum, the demand for this information is growing. The curriculum ties in with state and national science standards and presents information on IPM in a format that is straightforward and engaging for both teachers and students to learn. The Connecticut Mastery Tests and Connecticut Science Standards are being revised and teachers will be able to use the curriculum to meet the needs of these requirements. The IPM Curriculum has received a very enthusiastic response from teachers and curriculum specialists who attend the workshops.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme – Forest Stewardship

a. Activity - The forested land area of the state of Connecticut provides numerous values and benefits to the quality of life and economy of the state. Protecting public and private water supplies, supporting a $700+ million dollar annual forest products industry, providing the backdrop for a growing recreational and tourist industry, and wildlife habitat are just some of the benefits and values identified. The bulk of this forested land (83%) is owned by private individuals and groups. The continued health and productivity of the forest is threatened by parcelization, conversion to other uses, and fragmentation resulting from population pressures. Insects, diseases and fire are also significant threats to the health and productivity of CT's forestland. The Connecticut Forest Stewardship Program provides technical assistance and education to private forest landowners and forestry professionals, educating them in the advantages of actively managing forest holdings, and providing guidance in implementing management activities.

b. Impact - The primary indicator of the success of the Forest Stewardship Program has been shown to be the number of forestland owners (and acreage) utilizing the benefits of the program to obtain a Forest Stewardship Plan for their property and actively engage in the management of their forestland. Numbers of landowners enrolling in the program are up from the most recent previous years and acreage figures are also up as shown by 9,388 acres of new or updated stewardship plans, habitat improvement, timber stand improvements implemented on 1,168 acres and knowledge & information gained by 2,451 individuals, including at least 605 forest landowners. 39 forest and wildlife stewardship workshops and/or presentations to 876 people.

c. Source of Federal Funds – Smith Lever

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 posses. An annual Tree Warden School and Certification Program provide Tree Wardens with a voluntary educational opportunity to acquire this knowledge. 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.

b. Impact - On scales of 0 (poor) to 4 (excellent), Tree Warden School participants rated the school program 3.7 in terms of knowledge gained, with 3.5 in the applicability of the information to their Tree Warden duties. All participants found the final exam to be difficult, yet fair. In seven years, 195 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

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 59% 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 educational opportunities and programmatic support. Participants are required to return to their communities and perform community or state based urban and community forestry volunteer programs. Volunteers are 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 of 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 243 urban and community forestry volunteers have been trained. Participants have come from 69 Connecticut communities and three states.

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. Since 1992, volunteers have been the initiator or participant in the following example outcomes: 40 communities have written and passed shade tree ordinances; 29 shade tree commissions have been established; about 4,481 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.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - Recreational Sector for the Gulf of Mexico Red Snapper Fishery

a. Activity - This project explores approaches to more fully integrating the recreational sector into the management of fisheries, with an application to the red snapper fishery in the Gulf of Mexico. The intent is to initiate a dialog among all stakeholders – a dialog on alternative paths to sustainability, to fewer conflicts, and to greater benefits for all who have a stake in this valuable fishery. Activities included one week of workshops with participants, stakeholders, and regulators in the Gulf of Mexico Red Snapper Fishery (30+ participants), one peer-reviewed publication in *Marine Policy*, one published pamphlet for distribution to stakeholders and one invited presentation at the NOAA/NMFS St. Petersburg, FL office.

b. Impact - This research has created a strategy and outline for an entirely new management structure for recreational fisheries. The potential benefits of this new management method are being publicized in the policymaker, stakeholder, and academic community, with the ultimate goal of influencing on-the-ground management of recreational fisheries. The Gulf of Mexico red snapper fishery is the first fishery for which this new management paradigm will be formally proposed.

c. Source of Federal Funds – Hatch

d. Scope of Impact - National

Key Theme - Estimating Non-Use Values for Fish

a. Activity - This research assisted the Environmental Protection Agency (EPA) 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. Specifically, it assisted in the assessment of non-use values of fish and shellfish whose mortality would be prevented by the proposed rule. The research included an application of meta-analysis to estimate non-use values. Outputs included two technical reports to the Environmental Protection Agency and associated responses to peer-review one publication in *Water Resources Research* and one

presentation accepted for the annual meeting of the *Northeastern Agricultural and Resource Economics Association*.

b. Impact - This research provided the economic analysis necessary for approval and implementation of the EPA 316b Rule. Results provided by this effort had a direct and critical impact on policy development; namely the recent posting by EPA of 316b regulations for Phase II facilities.

c. Source of Federal Funds – Hatch

d. Scope of Impact - National

Key Theme - Land Conservation Techniques and Service Implementation

a. Activity - This research will 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. The supporting objectives concern the investigation of public preference for the non-market services of preserved land.

b. Impact - 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. Preferences for outcomes do not necessarily imply matching support for the underlying policy process.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

Key Theme - Taste Buds and Environmental Convictions in the Seafood Market. Activity - The objective of this project is 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. Impacts - 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.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Tsunami Response in Thailand
a. Activity - The tsunami of 26 December 2004 had significant impacts on livelihoods and fisheries in Southern Thailand. Assistance was provided to the State Department in identifying priority needs to help put Thai fishing communities back on their feet. Assessment of needs concluded that, among other things, a need existed for integrated coastal management planning, the development of a disaster management plan for tourists and fisheries, and a comprehensive assessment, monitoring, and rehabilitation program for coral reefs, beaches, forests, sea grass beds, mangroves, and other shoreline vegetation. Also proposed was an assessment of the feasibility of the engineering of wave breaks to forestall coastal erosion and allow for beach nourishment.

b. Impacts - The assessment work has resulted in a $2 million commitment from the US government to plan for integrated coastal management and coastal rehabilitation in three coastal provinces in Thailand.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

Key Theme - Aquaculture Law and Policy
a. Activity - During the past decade the aquaculture industry has begun to evolve from traditional on-bottom culture to surface and submerged culture of shellfish. The development of commercial hatchery and nursery technology and the use of grow-out gear have shown the potential for increased profitability of some sectors of the industry. The gear itself and associated markers has become more visible, causing concern to other users of the marine environment. As such, the regulatory process has become more stringent. Due to the complexity of the new permitting system, the application process became a daunting task for marine aquaculturalists, and an overwhelming undertaking for the large number of agencies involved in reviewing applications. Following mounting concerns from various stakeholders, a working group addressed the issues surrounding aquaculture permitting in the State. The permitting workgroup has presented its efforts at several industry and scientific meetings which attracted the attention of regional and national groups.

b. Impact - Extension, industry, and the regulatory community continue to attend aquaculture law and policy workshops, even though they do not see eye-to-eye on policies. The “new” permitting process for aquaculture structures has been clarified, and several constraints to marine industry development have been identified for future discussion and resolution.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - Lobster Fisheries Management in Long Island Sound
a. Activity - The Atlantic States Marine Fisheries Commission (ASMFC) enacts strategies to regulate fluctuating abundance of fish species, adapt to environmental effects and balance fishing sector pressures. One particular perplexing problem has been the drastic lobster resource loss

throughout LIS in late summer 1999. Through meetings with the LAMTs, DEP and DEC agency personnel, and ASMFC commissioners of each state, a plan was devised to "V" notch female lobsters for release and subsequent protection. The concept had to be scientifically defended as the better alternative, and all adjacent states and other LAMTs had to be convinced for passage as an ASMFC endorsed lobster resource conservation equivalency action.

b. Impacts - All states sided with the LIS lobster plan and consent from the National Marine Fisheries Service and U.S. Fish and Wildlife Agency to delay coast wide size increases, accommodated the recovery effort. The process thus far has shown positive impacts that have united coastal fishermen, agency personnel and lobbyists in a new innovative management strategy.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - Nonpoint Education for Municipal Officials (NEMO)

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 this 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 profiles both the program and the planning initiatives being implemented by town with which the program works. Over 60 educational workshops for local officials were conducted by request, on a variety of topics. Municipal towns included Torrington, Killingly, and Killingworth. The project created two new educational workshops: (1) Planning and design to improve stormwater quality, in conjunction with CTDEP, and; (2) "Map Reading 101. A new web site focusing on research on impervious surfaces, both conducted at UConn and across the country, was developed and posted.

b. Impact - The Town of Killingly is including the information from the NEMO workshop series into their town's Plan of Conservation and Development. This plan will form the basis for upcoming regulation changes that will include a number of strategies to protect water quality. The City of Torrington is in the process of updating 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 is proceeding with a community resource inventory. This inventory will be used as a basis of a town plan update, due to begin this summer. The Planning and Zoning Commission is also working to make changes to their zoning and subdivision regulations based upon the NEMO workshops. NEMO was featured in the cover article of the Earth Imaging Journal, a new publication devoted to practical uses of remote sensing information. 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. Putting Communities in Charge has drawn wide praise from a diverse audience, and ten towns have requested workshops and/or assistance related to land use planning and water quality after receiving the publication. In addition, towns highlighted in the publication have requested additional copies to further inform new commissioners and citizens, and in one instance a chief elected official of a town used the publication in a statewide conference to her peers.

c. Source of Federal Funds – Smith Lever

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 those 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. Nine scoping or training workshops were conducted, involving eight states, to initiate or assist NEMO Network projects. Kentucky, New Jersey, Hawaii, Illinois, South Carolina, North Carolina, Maryland and Virginia were involved. Program coordinators from North Carolina, South Carolina, and Pennsylvania visited the hub during the reporting period for one-on-one training/education sessions. Presentations were given at several national conferences and trainings, including the EPA/NOAA/USDA National Symposium on Land-based Sources of Pollution to Coastal Reefs, the NOAA Sea Grant Academy, and the conference of the Association of Photogrammetry and Remote Sensing. Two issues of a Network Newsletter were written and issued (both electronically and in hard copy). A network-wide web-based impact reporting form was created and implemented on the "Members Only" portion of the National NEMO web site. 19 programs returned the form. NEMO University IV, the fourth national conference of NEMO Network principals, was held in April, 2005 in Washington, DC. 29 states (either with existing programs or exploring starting a program) were represented at the conference.

b. Impact - The Network includes 31 programs in 30 states. New NEMO programs were initiated in Hawaii, Arizona, and Illinois. The NEMO Network was featured as an exemplary educational program in the U.S. Commission on Ocean Policy Report, a report commissioned by the President that is meant to serve as a blueprint for protecting the nation's coastal and ocean resources. NEMO Network programs are assisting communities across the nation to better plan and design development.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - National

Key Theme - Connecticut's Changing Landscape

a. Activity - Connecticut is a rapidly urbanizing state. Debates on growth-related issues like "smart growth" and "sprawl" are now common, both in town halls across the state, and at the State Legislature. The natural resource-based community planning and design process espoused by the UConn Center for Land Use Education and Research (CLEAR) suggests that communities first get a handle on their natural resource base; an important part of this is land use/land cover. The Connecticut's Changing Landscape (CCL) project is a unique study that has developed, for the first time in the state (and possibly the nation), directly comparable land cover data dating back to 1985. This allows Connecticut communities, agencies and researchers to assess land cover change, or trends over time. The emphasis of this study is the growth of developed land, providing information that directly supports NEMO's outreach effort on dealing with the impacts of development on water and other natural resources. The CCL web site is an extensive site that includes data, statistics, graphics and both downloadable and interactive maps. To date, about 40 briefings on the study results have been given to organizations around the state, including municipalities, environmental groups, academia, development organizations, and others. About 400 actual data downloads from 175 different organizations and individuals have been logged to date, by groups such as regulatory agencies, nonprofit organizations, city planning offices, consulting firms and academia. CLEAR, NEMO and the CCL study were featured in the new Earth Imaging Journal, and in The Hartford Courant in a front page article and in succeeding commentary and editorials. An MS student from the University of North Dakota is conducting a survey of municipal staff and others to evaluate the use of CCL data at the town and organizational level. While it is too early to summarize local "impact" data, at least 3 of the state's Regional Planning Organizations and at least 6 towns are using the CCL data for their land use planning. The Connecticut Office of Policy and Management (OPM) used CCL data in their update of the State Plan of Conservation and Development. CLEAR has procured a $45,000 grant from the CTDEP Office of Long Island Sound to continue and expand upon the CCL study focusing on the coastal areas. CLEAR has procured a $90,000 grant from EPA to continue and expand upon the CCL study, with a focus on stream corridors in coastal watersheds.

b. Impact - The Connecticut's Changing Landscape study, together with the Extension outreach on its results, informed the statewide debate on smart growth and sprawl, influencing land use policies at the local level and adding research-based facts to the debate in the state Legislature. The Hartford Courant's front page article on the study release sparked a widespread interest in the web site and its contents. The Courant Editorial stated: "The maps demonstrate as no words or numbers can the pace and type of change in the state with a reputation for stasis. At this rate, there won't be much left of the renowned beauty of the Land of Steady Habits. This extraordinary glimpse of Connecticut can be viewed online at www.clear.uconn.edu/projects/landscape/index.htm. The maps speak louder than an army of 'smart growth' advocates for the benefits of regional planning and property tax reform in protecting the environment, economy and quality of life. The university center plans to incorporate the newly completed maps into an education program for municipal decision-makers.

For its visionary work, it is owed the state's gratitude, and possibly a healthy grant to continue its outreach work."

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme - Center for Land Use Education and Research (CLEAR)

a. Activity - Despite its universal impact, land use remains a local issue that is decided primarily by individual landowners and land use boards at the town, township, and county levels. Local land use decision makers have few resources with which to track, analyze and understand the changes to their landscape, or to gauge the impacts that these changes have on the economic and environmental health of their towns. As concluded in a recent report by the U.S. General Accounting Office, non-regulatory education, information and technical tools are among the most effective, and cost effective, means by which to promote better local land use policies. Geospatial research and technology can play an enormously important role in providing decision support for land use decision making, but to date only a fraction of this potential has been realized. This project focuses on improving dissemination of more advanced research strategies and providing access to research data and tools to municipal users.

b. Impacts - CLEAR has developed a national reputation as the "go to" group for information on land cover mapping, impervious surface characterization, forest fragmentation, urban growth, and related land use issues. Requests have been received from around the world for code to the forest fragmentation and urban growth models. One Development of a Geospatial Model to Quantify, Describe and Map Urban Growth. The special issue on Remote Sensing to Urban Planning and Urban Ecology was the third most frequently requested from Elsevier's RSE Journal in this past year.

c. Source of Federal Funds – Smith Lever

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. Activities included an enhanced, Corridor-wide G.I.S. database on natural and agricultural resources, made available to Corridor towns on request for planning purposes. 59 Green Valley Institute (GVI) short courses, workshops and training sessions were taught to 1,269 Corridor community leaders, landowners and interested citizens. 70 volunteers trained and supported by GVI programs donated at least 1943 hours valued at some $33,400 and inventoried 24 miles of the Quinebaug River, provided 115 hours of monitoring to the Connecticut Amphibian Monitoring Program; completing nine Green Valley Brush Brigade work parties, and serving on numerous land trust, town and Corridor boards. The GIS Center assisted eight Corridor communities in developing natural resource inventories (NRI's), bringing the total to 18 since 2001; partnered with UConn CLEAR to teach two 5-day GIS short courses and two GPS trainings; partnered with The Nature Conservancy and the Windham Region Council of Governments to produce and prioritize maps of "co-occurring" natural resource areas for six communities. The GVI web site (www.thelastgreenvalley.org/gvi) received over 200 visits per month. GVI's community planning and community design faculty taught 21 programs across the Corridor and assisted 3 communities in forming new Conservation Commissions. In partnership with the local regional Councils of Governments, GVI's "Green Valley Connections" program is building a corridor-wide Greenways and Blueways map through a series of workshops.

b. Impacts – 2,939 acres of land have been permanently protected or are in the process of such protection as a direct result of GVI programs. As a result of GVI work: four communities are developing new Conservation Subdivision Regulations; two have developed new Fee-In-lieu of Open Space Subdivision Regulations; one developed a new scenic road ordinance; two are amending their design guidelines; and two are incorporating new land use economic goals into their Plans of Conservation and Development. In addition, attendees at workshops indicated: 60 % said they worked to promote new ideas/strategies in their communities, 55% read more on one of the topics they were introduced to at our workshops, 73% supported open space planning efforts, 53% explained to others the role of open space in balancing a community's budget and 55% explained to others the pros and cons of community growth.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – Regional (CT and MA)

Key Theme - Volunteerism in the Quinnebaug-Shetucket Heritage Corridor

a. Activity - The conservation and management of natural resources in Connecticut are heavily dependent on citizen volunteers. Municipal commissions, non-profit land trusts and Cooperative Extension are among the key groups that depend on volunteers with a variety of talents. Historically, a chronic shortage of volunteers has hampered the productivity of these groups. In cooperation with numerous partners, the Green Valley Institute is institutionalizing a system within the Quinebaug-Shetucket Heritage Corridor (QSHC) for recruiting prospective natural resource volunteers An annual educational program has been developed for new and novice volunteers. titled "A New Introduction to the Natural World" The program is offered free-of-charge to new recruits in exchange for their agreement to fill a vacant volunteer opportunity within the Corridor.

b. Impact - Of the 142 total program graduates, at least 103 (70%) have been successfully placed to date in community volunteer positions. Survey results revealed that at least 70 volunteers trained and supported through this program donated at least 1943 hours of time in 2004-2005, valued at some $33,400.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – Regional (CT and MA)

Key Theme - The Green Valley Institute and Community 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 bringing 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. "Village Design Guidelines" an eleven-page document that can be used to ensure new development fits its surroundings by being contextually sensitive to the history, community and environment of a village. "Design Guidelines for the Village and Gateway Districts of the Town of Coventry", "Design Guidelines for Willimantic Business (B-1) District" and "Lands of Unique Value in Mansfield" were developed to demonstrate innovative approaches to local land-use planning to intelligently and pro-actively plan for smart growth in the future.

b. Impacts - The Town of Coventry Planning and Zoning Commission expects to adopt The Village & Gateway District Design Guidelines and related regulation changes. The Windham Planning Commission has approved the Design Guidelines for Willimantic Business (B-1) District. The towns of Brooklyn and Scotland are discussing including a version of these design guidelines, tailored to their communities, in their regulations.
Mansfield passed a subdivision moratorium allowing the "Lands of Unique Value" (www.mansfieldct.org) vision to be incorporated into the town's Plan of Conservation and Development and zoning regulations and into the region's Growth and Preservation Guide Plan.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - Evaluation of Nutrient Management Plans in Connecticut

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 into streams. Phosphorus concentrations in streams at the parts per billion level have been shown to increase algae blooms and eutrophication of surface water. New regulations being written for Concentrated Animal Feeding Operations (CAFOs) would require farms to apply manure according to a strict phosphorus standard, to minimize the amount of P in runoff waters. This would mean that phosphorus levels in the soil would be used to determine the amount of manure and fertilizer that could be applied to a crop. Connecticut farmland soils are high in phosphorus from decades of animal agriculture and application of

generated manure. The nutrient management program (NMP) 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. A workshop to introduce NMPs to farms was conducted in 3 locations across the state. 50 farmers and NRCS staff attended these introductory sessions.

b. Impact – Results from 22 farms who implemented NMPs (from 100 - 1200 cows) have at least some excess manure. Without the development of off farm uses for manure farms will have difficulty complying with an environmental P standard. Results caused the Connecticut Department of Environmental Protection to recognize the problem and DEP has commissioned a study by Wright Pierce (environmental engineering firm) to determine feasible alternative uses for manure. The study will look at such things as manure to energy plants, pelletizing as fertilizer, regional composting and other possible uses for manure. DEP recognizes that without an external market for their manure, farms in CT cannot comply with an environmental standard for phosphorus loading on soils.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme – Turfgrass Best Management Practices

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. This research program is evaluating new technologies that will improve N fertilizer recommendations for turfgrass. The results will be of use to homeowners for lawn care, but also to turf professionals such as golf course superintendents, grounds keepers, sod producers, sports turf managers, and municipal workers with responsibilities of maintaining parks and recreational areas.

b. Impact – Research results 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 consider changing their current fertilization practices. Research also indicates that hand held light meters and anion-exchange membranes can improve upon the current recommendations for nitrogen fertilization of turf. These new technologies have the potential to better guide fertilization rates and times, which will result in a decreased threat of nutrient enrichment of water resources. As a result, a state-wide program has been initiated in partnership with the Residential Water Quality extension team and several Master Gardeners to disseminate results through a comprehensive education program.

c. Source of Federal Funds – Smith Lever
d. Scope of Impact – State

Key Theme - Urban Watershed Monitoring

a. Activity - Nonpoint source pollution is the primary cause of water quality problems in Connecticut and the U.S. Agriculture is the leading source of impairment in the nation's waters contributing to impairment of 25% of river miles and 19% of lake acres. Urban runoff contributes to impairment of 5% of river miles, 8% of lake acres, 18% of estuaries, and 7% of wetlands. There is a need to reduce nonpoint source pollution to the nation's water bodies to meet the goals of the Clean Water Act. The effectiveness of both agricultural and urban management practices to reduce nonpoint source pollution is largely unknown. The target audiences are primarily state and Federal agency personnel as well as the citizens of Connecticut as contributors to nonpoint source pollution. In the Jordon Cove watershed Best Management Practices (BMPs) were installed and water quality monitored and analyzed. Surveys were conducted of residents in the neighborhoods. A key BMP is the use of rain gardens, also termed bioretention areas, to reduce runoff from urban areas and treat stormwater pollutants. Two research rain gardens have been constructed in Haddam, CT, 12 in Waterford, CT, 40 in South Windsor, and two at the University of Connecticut to demonstrate the use of rain gardens and disseminate information on their design in Connecticut.

b. Impact - 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_3, NH_3, 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 expect TSS and TP, which increased. In the traditional watershed, stormwater runoff increased. Urban BMPs can be used in low impact development to reduce runoff to one tenth of traditional development, based on the Jordan Cove Urban watershed project results. The word on rain gardens continues to spread as requests have been received from the private and public sectors to review or design rain gardens.

c. Source of Federal Funds – Hatch, Smith Lever

d. Scope of Impact - State

Key Theme - Sustainable Landscapes

Activity - Homeowners as well as residential landscapers in Connecticut negatively impact water quality primarily through the use of excessive fertilizer and pesticide applications on suburban landscapes and lawns. Contamination to existing bodies of water and groundwater are increasing through these practices by both the professional and homeowner practitioner. Sustainable landscape techniques and practices are systems of gardening that utilize many of the same principles that natural ecosystem utilize. Sustainable landscapes reduce waste, energy and materials. A web site was created (http://www.sustainability.uconn.edu), 19 presentations on sustainable landscape techniques were made to 1,050 homeowner participants, and 3 presentations to 150 landscaper and grounds maintenance personnel on sustainable landscaping techniques.

b. Impacts – 86% of 30 participants in the 2nd Master Gardener Turf Training indicated plans to implement BMPs within the next year, with 38% changing fertilizer practices, 27% planting fescue, and 19% planting white clover. One contractor has decided to use fescue in his residential developments.

c. Source of Federal Funds – Hatch, Smith Lever

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. 152 Master Gardener program participants in Connecticut received education on this topic.

b. Impacts - 78% of respondents plan to change at least one residential management practice as a result of the program. This was a short term outcome.

c. Source of Federal Funds – Hatch, Smith Lever

d. Scope of Impact - State

Key Theme - Subsurface Gasoline Vapor Releases at Service Stations Causing MTBE Groundwater Contamination

a. Activity - Subsurface gasoline vapor releases from Phase II vapor recovery systems have been found to cause high levels of MTBE ground water contamination at service station sites. The primary objective of the research is to evaluate the cause and level of impact of subsurface vapor releases.

b. Impacts - Results have shown removing MTBE from the fuel will result in alleviating the problem. Results have been provided to oil companies, the American Petroleum Institute (API) and environmental consulting companies. The API sponsored a "brain-storming" meeting of representatives from the major oil companies, state regulators, the EPA and researchers at UCONN. The identification of this problem is beginning to be recognized in the environmental community. A consultant in Massachusetts reported that based in part on the work, a service station is going to use MTBE free fuel from Connecticut to alleviate the problem.

c. Source of Federal Funds – Hatch

d. Scope of Impact - State

Key Theme - 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. Up to date understandings of the subjects are limited in distinct fields such as meteorology, hydrology, and biology. Problems in each field are studied within a major medium (such as air, water, soil, and canopy) with closed pre-defined boundaries. Work focuses on the integration of hydro-meteorological, ecological, and economical processes at the regional scale and the development of a cascade of holistic models that can be used in examining the causation of multi-media environmental problems.

b. Impact - Multimedia modeling from this research has drawn a lot of attention in the scientific community. It may replace the old models for government agencies for studying and regulating purposes, and has been used in projects of the Connecticut River Airshed-Watershed Consortium. Human dimensions have been brought into the physical models, having the potential application on policy making processes regarding agricultural structure, ecosystem evaluation, and resources management.

c. Source of Federal Funds – Hatch

d. Scope of Impact – State

Key Theme - Connecticut River Airshed-Watershed Consortium

a. Activity - The Connecticut River Airshed-Watershed Consortium (CRAWC) is a consortium of environmental research faculty from the four land-grant universities in the four states, which share the Connecticut River basin. The purpose of the consortium is to join the resources and expertise from the four Universities to study and quantify the long-term fate of pollutants in the Connecticut River Basin. The primary pathways of contaminant movement and transformation inside the basin are through the air, soil, surface water and groundwater. The consortium is conducting a two-phase interdisciplinary research program to first resolve these most difficult interfacial problems, and then develop management tools for solving long term degradation problems.

b. Impact - The consortium is spawning a number of offshoot research proposals that use the consortium resources and findings in new lines of research. A USDA-NRI grant ($466,000) was received to study air pollution emissions from agriculture operations which will add critical data for the CT River Basin airshed modeling by using techniques being studied and developed in the consortium. Detailed reports and lists of accomplishments are available on the Consortium web site (www.ctraws.org).

c. Source of Federal Funds – Hatch

d. Scope of Impact – Region (CT, MA, NH, VT)

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.

As a result of participating in the Managing Your Money Series, 90% of participants indicated, on post-program surveys, that they felt better about communicating about money with their partners/spouses. Sixty percent indicated that they had begun to teach their children about money through the use of allowances. Twenty-five percent have set financial goals and have begun savings accounts to reach these goals.

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 Bridgeport for the Adult Education Center found 18 mothers or fathers reporting: 90% learned about different parenting styles and that moderate parenting is best for children and parents, 100% learned new techniques to manage stress, 100% learned new ways to talk with their children, 100% learned about the importance of using rules and routines in their homes and 100% learned new information about discipline.

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.

Another program highlight included a workforce preparation program for 4-H youth that offered youth entrepreneurship programs and work to 100 youth. The program integrated workforce participation into existing programs to foster the development of skills needed for entrance into the workforce. Youth demonstrated improved workforce readiness skills in business organization, money management and other relevant skills, with in-school attendance and teamwork skills improved.

Survey results for the People Empowering People (PEP) program showed that two of the three areas emphasized in PEP - personal strengths and parent/family relationships- were found to be significantly improved after the program. The third area targeted by PEP, community involvement and empowerment - was not significantly changed.

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.

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	855,726	13.67
Hatch	-	-
Multi-state research	-	-
State funds	966,807	13.21
Competitive grants	133,577	3.37
Animal health	-	-
Total	1,956,110	30.25

Key Theme - Family Functioning/Identity Theft Prevention

a. Activity – The Federal Trade Commission (FTC) reported that close to 10 million American's are the victims of identity theft annually. The latest FTC data reports that Connecticut is ranked 27th in the nation for victims of identity theft in FY 2004. According to the Identity Theft Center two categories of identity theft have seen a marked increase in the last few years. These are the theft of deceased person's identities and the theft of children's identities. 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. Train-the-trainer workshops and programs were conducted in Fairfield and New Haven counties, including 3 of the 5 Connecticut cities that are reported to be the top locations for identity theft as reported by the FTC. Train-the-trainer workshops have been conducted for 85 program participants, including social service agency staff and volunteers who work with senior citizens; housing authority personnel; assisted living facility staff; and municipal employees; teachers; law enforcement professionals; health care professionals; and high school students.

b. Impact – Post-program surveys indicated that 90% increased their knowledge related to consumer privacy rights, and 95% increased their knowledge about ways to minimize the risks of identity theft. One hundred percent intend to share the information with their clientele and other agency staff members; and their students. Thirty percent plan to conduct identity theft prevention programs for their clientele/students. Seventy will reprint fact sheets in their agency newsletters. Fifty-eight percent indicated that they intend to share the information with professionals at other agencies. Workshops have also been conducted for 400 adult participants of the following: senior groups; parenting programs; grandparents raising grandchildren programs; and social service agency coalitions. Educators attending the Connecticut Business Education Association and students attending the Connecticut Future Business Leaders of America Annual Conference participated in workshops. Post program surveys indicated that as a result of this training, participants 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. This was a short term outcome.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Identity Theft Prevention

Key Theme - Family Functioning/Financial Literacy Education

a. Activity – Making financial decisions has grown increasingly more complex with an ever-increasing array of options. Investment and retirement savings vehicles increase in complexity as do health care plans and a variety of consumer goods and services. There is a trend toward shifting more financial responsibility for health care insurance and retirement planning to consumers. With an increasing lifespan and medical technology, more savings are required to pay for later life. At the other end of the lifespan, many teens are earning a paycheck and are making financial decisions.

b. Impact –Program participants indicated that they would use information from the training with their clients and found the debt management information especially beneficial. By observation, 82% of 50 participants completed this activity. About 90% can identify at least one change they would be willing to make. Two thirds of the participants are concerned about their credit history and how it might negatively affect them. This was a short term outcome.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - Teaching Young Adults, Teens and Children about Managing Family Resources

a. Activity - Teaching young people about how to manage money is an important part of their practical education for life as an adult. According to the 2004 Visa USA Annual Back to School Survey, 56% of parents believe high school graduates are totally unprepared to manage their personal finances responsibly. Fewer than half of these respondents feel they are a good role model for their children regarding saving and spending A 2003 FleetBoston survey found that only 27% of respondents felt very well informed about managing household finances and among parents with children five or older, only 26% feel well prepared to teach their kids about basic personal finances. Only 15 percent of high school graduates nationally have taken a course covering personal finance basics. As part of the 2004 4-H Teen Connection a simulation experience was employed for 15 teens involving career exploration, decision-making and money management called “Welcome to the Real World.”

b. Impacts -.Of the 14 completing the evaluation: 100% agreed or strongly agreed that the program was interesting and that participating in it would help in the future, 93% agreed or strongly agreed that the activities were helpful, and 92% agreed or strongly agreed that the information was useful. Results were shared with family and consumer sciences teachers at the American Association of Family and Consumer Sciences/ Connecticut Affiliate. This was short term outcome.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme - Financial Awareness

a. Activity - Debate concerning the future funding for Social Security and Medicare are increasing apparent in the national news. Financial planning workshops were provided to 97 participants in residential substance abuse rehabilitation programs in New Haven, a women's residential program in New London and a shelter in Meriden. Financial literacy workshops encourage financially stressed people to start to take steps to gain control of their finances to improve their situation. Prior to the workshop, many participants are not familiar with setting goals and developing a plan for achieving them.

b. Impacts - Following instruction in the first session of serial workshops, all participants are asked to identify and write down two personal goals and begin to plan the steps they would need to take to achieve them. Though many find this difficult at first, more than 90% meet this basic objective. About 67% indicate that they did not how to budget prior to the workshop. This was a short term outcome.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - Family Functioning/Financial Management

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. The average income of Connecticut's families in the top one-fifth of earnings is 9.4 times higher than the average income of families in the lowest one-fifth. Connecticut's cost of living is 20% higher than the national average and has the highest tax rate in the nation. This economic situation is reflected by the fact that 24% of Connecticut families with children are low-income. 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. Managing Your Money program series were conducted as part of the Communication of Parent Effectiveness Skills program (COPES) at the Danbury Regional Child Advocacy Center. Series topics included setting family financial goals; developing budgets; credit and debt management; reducing expenses; children and money; and resolving consumer problems.

b. Impact - The Commission reports that 81% of the 102 clients who participated in this program achieved their goals, including improved money management skills. As a result of participating in the Managing Your Money Series, 90% of participants indicated, on post-program surveys, that they felt better about communicating about money with their partners/spouses. Sixty percent indicated that they had begun to teach their children about money through the use of allowances. Twenty-five percent have set financial goals and have begun savings accounts to reach these goals. In post-program interviews participants indicated that they would now save for big-ticket items, such as television sets or furniture, rather than use rent-to-own options. Social service agency staff in post-program evaluations reported that they felt more confident advising clients about money management. Evaluations also indicated that: 100% plan to use the skills learned in their work; 92% will distribute one or more worksheets to their clientele; 90% will

share workshop information with their co-workers; and 55% plan 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. This was a short term outcome.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - University of Connecticut Income Tax School

a. Activity - The University of Connecticut Income Tax School provides up-to-date and accurate tax information for Connecticut tax practitioners and their clients. Tax accountants, preparers, attorneys and enrolled agents are the target audience. This program is conducted in cooperation with the Internal Revenue Service, Connecticut Department of Revenue Services, and private attorneys and accountants. The output of the project is a two day tax school providing 16 continuing education credits for tax practitioners in Connecticut. In 2005 there were 211 tax practitioners attending the tax school, most from smaller practices within the state.

b. Impact - For twelve years this program has been fully enrolled. These practitioners use the information in this tax school to prepare tax returns for over 10,000 Connecticut residents each year. The school is a primary source of tax information for many Connecticut practitioners that serve individuals and small business clients in the state. 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

d. Scope of Impact - State

Key Theme - The People Empowering People Program

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. PEP embodies this empowerment model of looking at individual and family strengths. PEP is an innovative program designed to build on strengths of adults and older adolescents with limited financial resources. Individual change is encouraged through 10 two- hour training sessions and bi-monthly or weekly followup sessions. Participants work on two or more projects that benefit the community. The UConn School of Family Studies conducted a research study of the PEP program. A total of 122 individuals from various locations throughout Connecticut participated in the program.

b. Impacts - Survey results showed that two of the three areas emphasized in PEP - personal strengths and parent/family relationships- were found to be significantly improved after the program. The third area targeted by PEP, community involvement and empowerment - was not significantly changed. The evaluation pointed out that a more comprehensive evaluation of

community based programs was needed. The complete research was included in an article submitted to the Journal of Extension.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - Family Functioning/Healthy Environments for Children

a. Activity – It is now widely accepted that children have special vulnerabilities to environmental exposures. As evidence of this concern, the National Children's Study is currently under way to investigate environmental influences on children's health and development. 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. HEC specializes in translating sound research into practical information for a broad range of learners, including young children, literacy-challenged adults, and professionals.

b. Impact – *How Mother Bear Taught the Children about Lead*, a lead-poisoning prevention curriculum for Native American children, is part of the National Institute for Environmental Health Sciences (part of NIH) website. 3094 people have viewed this web site since January 2005. U.S. EPA Region 8 asked for permission to reprint *How Mother Bear Taught the Children about Lead.* Invited to produce the script for the animated children's video version of this story by EPA Region 1. *Volunteers Opening Doors: The Five Keys to Lead Safety* video, designed to raise lead awareness and to teach lead-safe work practices to volunteers who are working in painting and housing rehabilitation projects, is being used across the country as part of volunteer training programs. It is also being distributed nationally through the Lead Information Outreach Center. From June of 2004 to May of 2005, 258 English versions and 130 Spanish versions of this video have been distributed. Habitat for Humanity requested permission to post the video as a streaming video on its website (http://www.habitat.org). The video served as the foundation for a training program developed by the National Center for Healthy Housing, Columbia, MD. The video was selected for screening at the film festival of the American Public Health Association's annual meeting. The video has been used in the North Carolina Childhood Lead Poisoning Prevention Program. Based on the success of the volunteer video, HEC (Healthy Environments for Children) was asked to produce a lead-poisoning prevention video for do-it-yourselfers. *Henry and Fred Learn About Lead,* authored by the HEC program specialist and funded by the Hartford Department of Health and Human Services, has been used statewide. As part of *Lead Safe Work Practices (LSWP)* HEC continues to maintain a statewide trainer and worker database of course participants. Since LSWP began in 2002, 1400 have taken this course. This year 5 individuals were trained and approved as trainers for this course: a North Carolina Childhood Lead Poisoning Prevention Program educator, a bilingual consultant for ATC associates in New York City, the director of Rebuilding Together Hartford, a consultant for EnviroScience Consulting and a trainer from the UCONN Department of Environmental Health and Safety. This year Connecticut's LSWP course was presented as a model at a national training rollout in California. Chemscope Training Company asked for permission to use the lead-safe work practices curriculum in adult education classes. *Keep It Clean (KIC)* was piloted to selected local health departments that were representative of state demographics. Using a

train-the-trainer model, health department personnel were trained to train store employees. The in-store training has been piloted at 11 home improvement or hardware stores. Data from pre- and post-training evaluations and follow-up evaluations are summarized as follows: There were 48 responses for the pretest; 45 for the first posttest, and 35 for the second posttest administered 3 months later. *KIC* data analysis showed that trainees learned and retained lead paint safety practices. Test results show that there was an overall significant gain in knowledge between pre and posttests administered before and after training on the same day. A follow-up posttest administered 3 months after the training showed that significant learning had occurred overall. *Adventures of the Lead Busters Club* was distributed 160 English and 50 Spanish books to Rhode Island Department of Health, and 440 English and 440 Spanish books to New Haven Department of Health, along with teacher guides and certificates (160 English and 50 Spanish books). Distributed 75 copies of the Lead Tracker game at the fall and spring NELCC conferences at the request of EPA Region 1.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme – Family Functioning/Parenting Apart Workshops

a. Activity – Parenting People is a parent education curriculum developed by the University of Connecticut Cooperative Extension System for use by community agencies. In the Danbury area, a coalition of family and child service agencies, ParentNet, is coordinating parenting education. This coalition determined that parent education was a priority and that parents, especially those mandated by the courts to attend parent education classes should have timely, year-round access to parent education. Prior to this initiative, parents typically waited months to attend a class. This delay often had a negative impact on parent child reunification. ParentNet selected Parenting People because it was comprehensive, research based, flexible and easy to use. During this time period, 10 ten-week sessions were conducted reaching approximately 100 parents.

b. Impact –Approximately 80 % of participating parents are Connecticut Department of Children and Family (DCF) referred. Classes are conducted in English, Spanish and Portuguese reflecting the diversity of the population. 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; reported that their parenting skills improved substantially as a result of attending the programs; 100% of the respondents reported that they were using or planned to use new skills as a result of attending the program. Skills include: less yelling and hitting, more talking, being more consistent, developing and using rules and routines, having age appropriate expectations for children, using effective discipline. A train-the-trainer program was conducted for 5 community volunteers. All of the participants reported that, as a result of the training, they had learned new information that they can use to be a more effective presenter, how to establish credibility with audiences, how to use the curriculum with parents. A Parenting People program series in Bridgeport for the Adult Education Center found 18 mothers or fathers reporting: 90% learned about different parenting styles and that moderate parenting is best for children and parents, 100% learned new techniques to manage stress, 100% learned new ways to talk with their children, 100% learned about the importance of using rules and routines

in their homes and 100% learned new information about discipline. This was a short term outcome.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact – State

Key Theme - Children and School Success: What Parents Should Know

a. Activity - Danbury Children First, a community organization dedicated to serving children and families, initiated a new project for parents in the Danbury School System. They requested assistance from CES to provide a curriculum and training so that 18 community volunteers could teach programs at school sites throughout Danbury. Their target audience is immigrant parents.

b. Impacts - Participants reported the following on post program evaluations: 99% reported learning new information that they can use to be a more effective presented, 99% reported learning how to establish and maintain credibility with audiences, 100% reported learning effective presentation skills, 100% reported learning how to use the curriculum "Children and School Success" with parents and 100% reported that they were prepared to teach this curriculum.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme – Family Functioning/Science and Technology

a. Activity – The City of New Haven is an urban city with isolated pockets of under served populations with critical high-risk needs. Access to technology is out of reach for many under-served and economically disadvantaged families. The goal of this project is provide transferable techniques to youth that will teach children, parents or grandparents how to use and access technology. Youth will receive training that will help them develop and strengthen life skills for academic and workforce preparedness through this After School Computer Program. Youth and adults will access resources to learn technology for necessary skills to become contributory individuals in the quickly emerging technological society (job skills, resume writing, research, etc). Twelve youth were trained as technology facilitators. Fifty-three youth and adults have been trained as secondary audience for technology.

b. Impact –In collaboration with the Dixwell Newhallville Mental Health Clinic an Internet café was completed. Teen facilitators have been teaching adults in the café. The Executive Director is so pleased with program; he is applying for additional funding to continue the NCP facilitators at his agency. There was a proposal by a collaborating agency to expand the program during the summer after camp hours (everyday) and afternoons during the school year. There is increasing adult interest in the computer program as evidenced by more phone inquiries. The agency director also expressed interest in training adults who are completing incarceration as a life skill for re-entering the job market. Another agency wants to offer a weeklong summer computer camp and will be exploring funding opportunities to support it.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - 4-H Youth Development/Leadership Education

a. Activity – The Cooperative Extension 4-H Youth Development Program provides experiential learning opportunities for youth by caring adults in all life skills areas including leadership, citizenship and personal development. Waterbury "Opening Doors" is a collaborative effort between the University of Connecticut Cooperative Extension System Youth Development Program, Waterbury Youth Services, Inc. and Waterbury Regional Workforce. 16 teens of limited resources are trained and supervised in leadership education, workforce preparation and animal science. In addition to participating in workshops on public presentation, conflict management, employability, team building and teaching skills, teens participate in community service activities and teach youth in other community agencies about animal science. During the past year, they conducted workshops with about 200 younger children.

b. Impact – Waterbury "Opening Doors" teens have demonstrated their increased knowledge and have shown marked improvement in their ability to work with younger children, their peers and adults and coping with daily crisis in their personal lives. They have also shown improved employability skills and school attendance and grades. Two graduates from the program last summer have successfully completed a year at local community colleges and three more youth will be graduating in June. All three are heading off to a post-secondary experience. Youth take an active role in performing community service above the requirements for the program. Most have reported improved confidence in their speaking ability as they continue to teach animal science to other community agencies.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - 4-H Afterschool/Out-of School/Child Care

a. Activity – An estimated 610,000 youth age 5-17 years old reside in Connecticut. Of these, 1/3 or 185,000 youths are involved in supervised, safe, enriching after school programs. 91% of parents and school personnel surveyed believe it is "very important" that before and after school activities be available at their schools. However, 41 % of elementary schools do not offer programs. Extension is an excellent resource for child care professionals who seek research, information on best practices, and curricula appropriate for out-of-school youth. Nationally and statewide, there is an increased focus on developing and maintaining high quality out-of-school programs that will serve greater numbers of youth. Training was offered to professionals both nationally and in-state which highlighted Extension resources.

b. Impact – Data collected indicates Extension professionals found the Extension CYFERnet School Age web site to be beneficial to their work as educators. ECI and CSACA surveys from the CSACA Conference revealed that 88% of the participants rated the workshop between good and excellent, 92% considered the content to be relevant and useful to their child care programs, 88% would recommend the program to other child care professionals and 14 participants are

interested in having staff and parents receiving training in the 4-H Afterschool Curriculum. As a result of a poster session at Statewide School Age Summit, twelve professionals are interested in receiving training on the 4-H Afterschool Curriculum. This includes the one legislator who has been successful in securing funding this session for after school in three Connecticut towns. This was a short term outcome.

c. Source of Federal Funds – Smith Lever

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: (1) skillful in interpersonal communication skills; and (2) 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 will be provided for youth to demonstrate and enhance their public speaking skills. Volunteers are necessary to the success of this program. Volunteers act as activity middle managers and coordinators, workshop presenters and evaluators for public speaking, coaches and group leaders. Youth generally attend public speaking workshops that focus on content organization and delivery. In addition to our 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 and as commentators for various 4-H events.

b. Impacts - 75 youth increased their skills in public speaking (material organization and delivery). Youth demonstrated their proficient use of public speaking skills as follows: 42% conducted a demonstration, illustrated talk, or speech during the Public speaking contest, 17% delivered oral reasons for horse judging placements at the State contest, 12% youth served as commentators at various 4-H activities, 10% were guests on a one-half hour cable TV show.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - 4-H Youth Development/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 futures and provides them with coping skills to be successful in today's world.120 registered 4-H Club volunteer leaders provided the local officer leadership opportunities to teens through their club programs

b. Impact – 100 youth are currently serving as officers in 4-H clubs, two teens are full board members of the Litchfield County Extension Service Association (an advisory committee for Cooperative Extension), and two teens serve as members of the state teen ambassador group. Another teen is a full board member of the Litchfield County 4-H Foundation, the first to serve in this capacity. Two teens received training in youth and adult partnerships and are now part of

the CT teams that will help other groups work in youth/adult partnerships. 20 teens provide leadership for the 4-H program, as junior leaders. 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 of them earned state recognition as representatives to the Citizenship Washington Focus Program. The effectiveness of the 4-H program to reach groups of children is enhanced through the 4-H junior leadership concept.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - 4-H Youth Development/4-H LIFT

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. Willimantic is a small city, very urban, with a large Hispanic population. This year LIFT enrolled 125 students, about 12% of the total school population. In a community plagued by poverty, crime and substance abuse, LIFT provides a safe and structured place for students to participate in enrichment activities and homework time.

b. Impact - 4-H LIFT students have a 98.7% average daily attendance rate, 5.2% HIGHER that school average. They have significantly less discipline incidences as well. Students who participated in the full year of LIFT averaged a full grade higher in Language Arts than those who quit, and a half grade higher than those who did not participate in the program. The students participated in an anti-bullying program, creating posters either individually or as a team, which were submitted to the Windham Arts Collaborative. The posters were framed and juried and 2 LIFT individuals and 2 LIFT teams won monetary prizes, which were shared by the students and LIFT. Three of the posters are now on permanent display at Windham Middle School. Five of the students at LIFT are from self-contained classrooms (either developmentally disabled or social/emotional maladjusted). On the first LIFT Family Fun Night, 75 people (14 families in all) attended. LIFT received 258 applications this year, which means 25% of the entire student body wanted to participate in the program!

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - 4-H Youth Development/Math Common Core Curriculum

a. Activity – The 4-H Center at Auer Farm provides quality educational experiences to youth, predominately in the Greater Hartford area. Connecticut has a new framework for science curriculum for pre-K through high school. In 2008 Connecticut expects that all school children will pass a State Mastery Test in science. The 4-H Center provides 30 different educational curricula that correspondingly meet the objectives taught by grade level as prescribed in the CT Science Framework and when appropriate, combine lessons that have their base in the Common Core for math. Programs selected by the Hartford and Bloomfield school systems correspond

100% to the CT Framework and Common Core. The initial classes were Ecosystems and Biotechnology provided to 6th and 7th grade classes at Bloomfield Schools.

b. Impact – Statistics show that 4H Center education programs were selected for over 17,000 children and teachers in grades pre-K through high school during this impact period. Programs selected by the Hartford and Bloomfield school systems correspond 100% to the CT Framework and Common Core. The 4-H Center at Auer Farm is recognized as a credible education resource to the schools in Connecticut and has been asked to be included by other groups on proposals as the education component for both students and teachers.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme - 4-H Youth Development/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. CES is also in a unique position to be an educational resource to others in the camping industry.

b. Impact – A group of 20 representatives from all 4 4-H camp foundations has demonstrated that they have learned skills to work together and network by attending meetings to plan a comprehensive staff training conference. They have increased their networking skills as evidenced by the increase in calls they have made to each other, requests they have made to the Extension Educator, and practices they have adopted from other camps. Other foundation members have also learned these skills. They were also mailed educational material at least monthly. 3838 youth attended a CT 4-H resident camp for at least a week last summer. Survey of 3838 youth who attended a CT 4-H resident camp for at least a week revealed that 96% of camper parents found their child's camp experience was excellent or good, 61.9% felt that camp has had much impact on their child or teen's ability to make new friends, 51.3% felt that camp has had much impact on increasing self esteem, and 51.5% felt that camp has had much impact on their child or teen's willingness to try new things. 100 CT 4-H camp staff completed a comprehensive training conference program increasing their skills in working with youth and demonstrating that throughout the summer. 55 camp professionals from throughout the United

States learned more about Conflict Resolution: Dealing with Challenging People in Difficult Situations at the American Camping Association National Conference in Orlando, FL. Educational material is available to all members through the ACA website and a special interview on a DVD. This was a medium term outcome.

c. Source of Federal Funds – Smith Lever

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" curriculum is a focus. CT 4-H was a member of the team that contributed to the national effort to develop a curriculum in work force preparation with GET INTO THE ACT!, a workforce readiness curriculum for middle schoolers.

b. Impact – GET INTO THE ACT was reviewed and accepted into the National 4-H curriculum collection. The R.I.S.E. manual (Respect and Integrity through Skills and Education) continues to be distributed nationally, with over 43 sold this year. A total of 268 manuals have been distributed since 2001. 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. Approximately 10-12 curriculums were reviewed and R.I.S.E. was "determined one of the best we could offer". A collaboration with Housatonic Valley Coalition Against Substance Abused has resulted in the development of STEP-UP! "A Summer Drug Prevention and Workforce Readiness program. In partnership with Fairfield County Extension Council, a mini-grant ($250) system was developed for youth interested in community service and entrepreneur projects. A national 3-day training on "Implementing the R.I.S.E. Curriculum into Your Afterschool Workforce Program, was conducted.

c. Source of Federal Funds – Smith Lever

d. Scope of Impact - State

Key Theme – Citizenship Education

a. Activity -Citizenship Education is one of the nine key areas of emphasis for the University of Connecticut's 4-H Youth Development Program. 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. The challenges they will experience will provide them with new skills which will enable them to be active participants in the future. In addition to acting with concern for the community and environment through community service, 4-H members also learn many of the rights and

responsibilities of being an informed citizen. Participation in club meetings, local fair boards and activity planning committees offers practice in leadership skills including leading a group parliamentary procedure, negotiating skills and running a group. Local, state, national and global government success will depend even more on citizen action in the 21st century. The Cooperative Extension 4-H Youth Program, sponsored by the University of Connecticut College of Agriculture and Natural Resources strongly encourages community service involvement on the part of all program participants.

b. Impacts - Statewide – Ninety youth and adults increased knowledge of the functions of the state government participating in 4-H State Citizenship Day in April. Participants met with legislators to discuss local issues and increased their skills in contacting elected officials. Almost 100% of organized community groups have reported participation in a community service project by its members (approximately 600 youth).

c. Source of Federal Funds – Smith Lever

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. The 2005 Leaders' Forum focused on the role of the College in assisting towns. The target audience was elected town officials and volunteers who serve on town boards and commissions. Extension works in all 169 towns in the state. In the past, we have not specifically focused on assessing the needs of this group. Presentations included GIS, water, and food security town by town.

Topics identified by participants as being of particular interest included: land preservation, food security issues, organic lawn care issues for schools, ways to increase revenues without increasing taxes, role of GIS to locate shellfish beds, transportation challenges, developing sound building codes that are environmentally friendly, and water resources related to town populations. Topics identified of importance and not addressed during the Forum included: urbanization, planning commissions, developing niche crops, overcoming political boundaries, urban gardens, and eminent domain. Following the event, volunteer members of Extension Partner groups requested packets to share with the selectmen in the towns in their counties who were unable to attend.

Other efforts conducted within, as well as outside of the College, include needs and trends as identified in a needs assessment for nutrition education, in the Sea Grant program assessment, during two listening sessions, in the monthly Extension Bulletin newsletter, regarding the needs of non-English speaking farm employees, and in gathering stakeholder input by Extension Councils.

Needs Assessment for Nutrition Education

In cooperation with the Connecticut Food Policy Council, Extension sponsored a workshop in March 2005. Findings included the need to meet nutrition needs in a unified manner with a clear and consistent message, to halt the trend of childhood obesity, to receive Congressional support for fruits and vegetables, and to support state legislation of wellness plans for schools and for funding these plans. Resources needed were identified as well as short and long-term action steps.

The Connecticut Sea Grant Program

A needs assessment of the shellfish aquaculture industry was conducted for this integrated Extension program. Needs were identified and prioritized through a mail survey, personal interviews, and an industry summit. Government and public relations, or lack thereof, are major constraints to the industry. Industry members would like to see the streamlining of the permitting process and developing positive relations with regulatory agencies. A working group is being developed to address these issues through collaborative research, outreach, and education.

Listening Sessions

Two listening sessions were conducted-one for the Farm Bill and one for the Commissioner of Agriculture. Working in conjunction with NRCS and FSA, Extension hosted and recorded producer, town official, and employee comments on needs for adjustments in the next Farm Bill as well as needs for a more effective state Department of Agriculture.

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, was hired to conduct 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 is working with each to develop a process for collecting stakeholder input in the format of a what's on your mind questionnaire. Progress in encouraging councils to assume responsibility for the survey and to schedule Dr. Manfredi has been slow.

Extension Volunteers

Extension volunteers comprise the state Extension Partners group that meets at least twice 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 second year and planned and conducted their second Legislative Reception at the Capital. This second reception was much better attended than the first. The 4-H teen ambassadors are planning their first legislative breakfast as part of the annual 4-H Citizenship Day as a means to assist in gathering input into programs.

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 data on farm workers in the Northeast, economic trends, children and poverty, what teens do after school, and social health as related to the quality of life in the state.

Food Insecurity in Connecticut

The Connecticut Food Policy Council commissioned a study conducted by a faculty member in the Department of Agricultural and Resource Economics on food insecurity. Variables of what creates food insecurity were measured for each of the 169 towns in the state using existing data sources. This needs assessment for a very fragile group in a state of such wealth is critical for the development of policy in the state. This work was presented at the 2005 Leaders' Forum and distributed to all legislators in the state.

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 will be followed by a conference this spring for researchers related to 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 pubic comment.

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 pubic 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 suggests 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 efforts saw the successful development of a recombinant DNA vaccine for Infectious Bronchitis virus, a highly contagious respiratory and urogenital disease of chickens. Trials are currently under way in 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 of 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 in New England and New York 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.

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. Surveillance programs to monitor poultry and other birds' diseases resulted in control of ILT and infectious bronchitis infection control. 3.5 million birds were protected from IBVD spread.

Producers significantly increased participation in crop insurance programs as a result of risk management education programs.

In the areas of a *Safe and Secure Food System* (Goal 2) research and extension programs addressed important issues to maintain product quality, including HACCP education programs for food businesses and processors.

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

Docosahexaenoic acid (DHA) research designed to assess the role of foods with DHA on sleep patterns of newborns demonstrated that infants born to women with gestational diabetes mellitus (GDM) have a less mature central nervous system (CNS). There has been broad interest internationally since the data provides the basis for exploring mechanisms and intervention.

Research on the effects of exercise on protein utilization in healthy, non-obese children versus obese children was conducted. Results will help to characterize the relationship between energy intake and protein metabolism in obese and non-obese children, thereby providing for the development of guidelines for management of pediatric obesity.

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.

The CT Team Nutrition Healthy Vending project saw over 6000 Connecticut students choosing healthy beverages and snacks at school, with the nutrition standards and allowable food list developed being used as a basis for statewide legislation for all public schools ("An Act Concerning School Nutrition Bill 1309"). As a result over 40,000 students from 10 school districts are benefiting from newly developed nutrition and physical activity policies in their town and schools.

Husky Nutrition Program works with parents and families to solve nutrition-related anemia among children in Hartford resulted in increased awareness of providers and caretakers of the problem, development of a statewide coalition, and re-evaluation of delivery of Women Infant Children Service by the Hartford Health Department. Results from the breastfeeding peer counseling trials led the WIC program to provide additional funding for expanding HFNP's breastfeeding peer counseling program. Every dollar invested on this breastfeeding peer counseling program is likely to return $4.60 in saving. The state could have annual net savings of up to $6.9 million per year if program is expanded to all low-income women served by the WIC program.

Husky Nutrition Program work with parents and families to solve nutrition-related anemia among children in Hartford resulted in increased awareness of providers and caretakers of the problem, development of a statewide coalition, and re-evaluation of delivery of Women Infant Children Service by the Hartford Health Department.

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.

Research and extension efforts in the area of invasive plant species resulted in the development of a statewide invasive species educational web page and 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.

Municipal land use officials participated in an innovative program, 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. Outcomes included 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.

Programs were focused on both the national and local level through the nationally acclaimed NEMO program (Nonpoint Education for Municipal Officials). The Network includes 31 programs in 30 states. New NEMO programs were initiated in Hawaii, Arizona, and Illinois. The NEMO Network was featured as an exemplary educational program in the U.S. Commission on Ocean Policy Report, a report commissioned by the President that is meant to serve as a blueprint for protecting the nation's coastal and ocean resources. NEMO Network programs are assisting communities across the nation to better plan and design development. NEMO efforts in Connecticut 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. Putting Communities in Charge has drawn wide praise from a diverse audience, and ten towns have requested workshops and/or assistance related to land use planning and water quality after receiving the publication.

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.

Results from 22 farms who implemented nutrient management plans demonstrated they have at least some excess manure. Results caused the Connecticut Department of Environmental Protection (DEP) to recognize the problem and DEP has commissioned a study to determine feasible alternative uses for manure. The study will look at variables such as manure to energy plants, pelletizing as fertilizer, regional composting and other possible uses for manure. DEP recognizes that without an external market for their manure, farms in CT cannot comply with an environmental standard for phosphorus loading on soils.

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.

As a result of participating in the Managing Your Money Series, 90% of participants indicated, on post-program surveys, that they felt better about communicating about money with their partners/spouses. Sixty percent indicated that they had begun to teach their children about money through the use of allowances. Twenty-five percent have set financial goals and have begun savings accounts to reach these goals.

Survey results for the People Empowering People (PEP) program showed that two of the three areas emphasized in PEP - personal strengths and parent/family relationships- were found to be

significantly improved after the program. The third area targeted by PEP, community involvement and empowerment was not significantly changed.

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.

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 Bridgeport for the Adult Education Center found 18 mothers or fathers reporting: 90% learned about different parenting styles and that moderate parenting is best for children and parents, 100% learned new techniques to manage stress, 100% learned new ways to talk with their children, 100% learned about the importance of using rules and routines in their homes and 100% learned new information about discipline.

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.

Another program highlight included a workforce preparation program for 4-H youth that offered youth entrepreneurship programs and work to 100 youth. The program integrated workforce participation into existing programs to foster the development of skills needed for entrance into the workforce. Youth demonstrated improved workforce readiness skills in business organization, money management and other relevant skills, with in-school attendance and teamwork skills improved.

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 Hispanic residents in nutrition education, 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 and minority populations benefited through an anemia program for health care providers, 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 was conducted to determine immigrant farm worker issues.

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, many 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.

(S-301)
Turfgrass is attacked by several insect pests which feed on the root systems and on above ground plant parts. Though, the most damaging turf insect pests are the immature stages of the scarab beetles or white grubs. Among these root-feeding scarab beetles are the Japanese beetle, Oriental beetle, Asiatic garden beetle, and European chafer. The major tool to manage these turfgrass insect pests has been the use of conventional insecticides both in production areas and 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. Thus, this project seeks to advance the use of biologically-based alternatives that will be easy to implement by sod-producers, managers and homeowners. The objective of the project is to evaluate the efficacy of the entomopathogenic fungus Metarhizium anisopliae as a biopesticide against Japanese beetle grubs.

(NE-1022)
Environmental variables such as light and noise may either enhance or adversely affect the growth and well being of poultry. The purpose of the project is to determine how newer lighting technologies affect poultry growth. The project will also measure the noise levels in poultry facilities and their effects on stress and distress vocalizations.

(NE-1023)
Despite the importance of fruit, vegetable and whole grain intake in maintaining health and functional status, older adults are not meeting minimum dietary recommendations. This project aims to improve fruit, vegetable and whole grain intake to reduce diet-related disability, obesity and chronic disease rates among older Americans.

(NC-7)
Japanese barberry is an invasive woody shrub that is beginning to be regulated in commerce. Cultivars of barberry, especially purple-leaved forms, are important landscape shrubs with substantial economic importance. Although the species is clearly problematic, it is unclear what invasive threat is represented by horticultural selections of the species. This research will examine fruit production, germination capacity, phenotype and seedling vigor of cultivars of Japanese barberry in comparison to the species. It will also investigate the ability of purple-leaved forms of barberry to grow and persist in shaded conditions. AFLP DNA fingerprinting techniques will be used to ascertain the genetic origin of feral populations of barberry.

(W-1133)
Traditional real estate appraisal techniques and market analyses fail to provide accurate estimates of the true value of agricultural and forested open space to society. This project will provide information on the types and magnitudes of non-market values associated with farm and forest preservation, and how these values vary across policy contexts.

(NC-1019)
Respiratory diseases are the major group of diseases affecting poultry. Consequently, losses induced by these diseases are of major economic impact on the producer, the local economy and the US economy. Many endemic respiratory infectious diseases in the USA continue to decrease the profitability of commercial poultry production. Viruses, bacteria and fungi cause respiratory diseases or interact to cause disease. Reduce the impact of threats to agricultural production by expanding the knowledge base needed to rapidly and effectively manage pests, disease, and natural disasters.

(W-1002)
Little information exists on the health benefits and safety of common dietary polyphenols in this particular segment of the US population. This project is designed to systematically screen many polyphenols for their effects of lipid absorption and fat-soluble vitamins, with emphasis on their bioavailability.

(NE-1009)
A. Mastitis is the most costly disease currently affecting dairy cattle. Screening tests for detecting antibiotic residues in milk are only validated for milk from the bulk tank or tanker truck and have not been evaluated for use with milk from individual cows. This project examines if treating heifers with an intramammary antibiotic prior to calving will reduce mastitis and improve productivity. The purpose of this study is to evaluate the performance of antibiotic residue screening tests for testing milk from individual cows.

(W-1001)
Rural regions and communities are rapidly transforming due to increased immigration, changes in age and ethnic composition, and social and economic restructuring. The research will provide a comprehensive picture of the changing nature of the rural U.S. population and the impact of that change on social and economic opportunities. The project will provide an integrated set of

studies that analyze critical demographic trends and draw conclusions about their implications for local economic and social life.

(NE-1007)
Impaired reproductive performance is one of two major causes of reduced productivity for dairy cattle and represents the major cause of reduced profitability for meat animal losses. This study will address the causes of these problems. This project will examine mechanisms by which nutritional, management and environmental factors impact ovarian activity and the subsequent effect on pregnancy and calving rates.

(W-171)
Understanding of the underlying biological mechanisms and principles of methods used to produce genetically altered livestock is limited. Furthermore, most of these methods are very inefficient. To realize the advantages of transgenic farm animals for human food and fiber production, the technologies for generating transgenic animals will have to be substantially improved.

(NE-1000)
Crop rotation effects on weeds are an aspect of weed management that has received little research. The length and type of rotations that are best able to reduce herbicide inputs are unclear. Growers choose between crop rotation and monoculture based on agro-climatic and economic factors. Land-poor vegetable producers in the N.E. have few economically viable options but to rotate vegetables with vegetables. The purpose is to evaluate five vegetable crop rotations to determine their impact on weed density.

(NE-187)
Turfgrass areas are perceived to contribute significantly to the pollution of surface water (phosphorus, nitrates, and pesticides) and ground water (nitrate and pesticides). A better understanding of the fate of fertilizers and pesticides in turfgrass systems is needed to evaluate and develop best management practices that minimize any potential adverse effects on humans and the environment.

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: 2005

Select One: ☐ **Interim** **X Final**

Institution: University of Connecticut

State: Connecticut

	Integrated Activities (Hatch)		Multistate Extension Activities (Smith-Lever)		Integrated Activities (Smith-Lever)
Established Target %	25	%	3	%	25
This FY Allocation (from 1088)	974,958		1,946,488		1,946,488
This FY Target Amount	243,739		58,395		486,622
Title of Planned Program Activity					
Assessments			15,600		
Food & Safety	48,492		6,936		88,126
Natural Resources	35,162		48,876		101,988
Dairy & Livestock	39,674				51,161
Sustainable Agriculture	77,932		4,518		106,750
Horticulture	21,202		734		41,876
Publications					71,289
Economic Viability	27,723				27,024
Family, Youth, Community			43,672		
Total	250,185		120,336		488,214
Carryover					

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 **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.

- Extension and research efforts in the Hazard Analysis Critical Control Point (HACCP) systems continued to evolve as surveys of consumers, producers and farmers were undertaken, and education programs directed to cheesemakers, as part of a long-term research and education effort in this area.

- 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. Surveillance programs to monitor poultry and other birds' diseases resulted in control of ILT and infectious bronchitis infection control. 3.5 million birds were protected from IBVD spread.

- Extension activities addressed the emerging issues of land use and water quality protection. Programs were focused on both the national and local level through the nationally acclaimed NEMO program (Nonpoint Education for Municipal Officials). National leadership resulted in NEMO adaptations now underway in 31 states across the United States. NEMO efforts in Connecticut resulted in programs delivered to representatives from virtually all Connecticut towns, with many communities revising their comprehensive plans and/or taking other important public policy actions to better protect water resources.

- Results from a joint research/extension paired watershed residential water quality project saw numerous changed landscape management practices and significant reductions in bacteria and nitrate-nitrogen leaving the targeted watershed. Expansion of activities in this area was accomplished through a regionally-funded Water Quality 406 project for New England.

- 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. Vegetable and greenhouse producers benefited from a number of New England-wide programs, conferences and publications.

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 efforts saw the successful development of a recombinant DNA vaccine for Infectious Bronchitis virus, a highly contagious respiratory and urogenital disease of chickens. Trials are currently under way in chickens.

- 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. Surveillance programs to monitor poultry and other birds' diseases resulted in control of ILT and infectious bronchitis infection control. 3.5 million birds were protected from IBVD spread.

- Involvement by College faculty in a major lobster mortality event in Long Island Sound enabled researchers to identify the impact of transient exposure to relatively low concentrations of malathion can have on defense mechanisms, possibly making them more susceptible to infections.

- Research work on docosahexaenoic acid (DHA) was designed to assess the role of foods with DHA on sleep patterns of newborns demonstrated that infants born to women with gestational diabetes mellitus have a less mature central nervous system. There has been broad interest internationally since the data provides the basis for exploring mechanisms and intervention.

- Results from 22 farms who implemented nutrient management plans demonstrated they have at least some excess manure. Results caused the Connecticut Department of Environmental Protection to recognize the problem and DEP has commissioned a study to determine feasible alternative uses for manure. The study will look at such things as manure to energy plants, pelletizing as fertilizer, regional composting and other possible uses for manure. DEP recognizes that without an external market for their manure, farms in CT cannot comply with an environmental standard for phosphorus loading on soils.

- 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.

- The Connecticut's Changing Landscape study, together with the Extension outreach on its results, informed the statewide debate on smart growth and sprawl, influencing land use policies at the local level and adding research-based facts to the debate in the state Legislature. The Hartford Courant's front page article on the study release sparked a widespread interest in the web site and its contents. The Courant Editorial stated: "The maps demonstrate as no words or numbers can the pace and type of change in the state with a reputation for stasis. At this rate, there won't be much left of the renowned beauty of the Land of Steady Habits. This extraordinary glimpse of Connecticut can be viewed online at www.clear.uconn.edu/projects/landscape/index.htm.

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.

- 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.

- Extension and research efforts in the Hazard Analysis Critical Control Point (HACCP) systems continued to evolve as surveys of consumers, producers and farmers, with particular emphasis on cheesemakers and cider makers, were undertaken as part of a long-term research and education effort in this area.

- Public understanding of milk pricing problems in New England and New York 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.

- 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. Surveillance programs to monitor poultry and other birds' diseases resulted in control of ILT and infectious bronchitis infection control. 3.5 million birds were protected from IBVD spread.

- The viability and financial health of Connecticut agricultural producers through crop insurance and risk management education resulted in significantly increased participation in crop insurance programs by Connecticut producers.

- Recommendations to improve crop pest management/crop productivity and to create new production opportunities for the greenhouse industry were developed and disseminated through a variety of educational methods.

- 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.

- Survey results for the People Empowering People (PEP) program showed that two of the three areas emphasized in PEP - personal strengths and parent/family relationships- were found to be significantly improved after the program. The third area targeted by PEP, community involvement and empowerment was not significantly changed.

- *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.

- 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 Bridgeport for the Adult Education Center found 18 mothers or fathers reporting: 90% learned about different parenting styles and that moderate parenting is best for children and parents, 100% learned new techniques to manage stress, 100% learned new ways to talk with their children, 100% learned about the importance of using rules and routines in their homes and 100% learned new information about discipline.

- Research and Extension efforts in the area of invasive plant species resulted in the development of a statewide invasive species educational web page and 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.

- Municipal land use officials participated in an innovative program, 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. Outcomes included 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.

- The nationally acclaimed NEMO program (Nonpoint Education for Municipal Officials) in Connecticut 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.

- 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.