

## Connecticut Annual Report of Accomplishments FY2000

### 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.

Plant research efforts yielded plant development for commercial introduction of new plants in the Alstroemeria series, including the only fragrant Alstroemeria in the world, 'Sweet Laura\_' which is winter hardy to USDA zone 5. Rhododendron disease control, which is a critical concern to this very valuable ornamental crop, was addressed through the development of transgenic rhododendrons that show resistant to Phytophthora (root rot), and a diagnostic assay employing PCR.

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. Efforts were underway to develop an effective vaccine against PRRS - a swine disease affecting the industry. A DNA vaccine carrying PRRSV ORF-5 has been constructed.

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 bronchoitis infection control. 3.5 million birds were protected from IBVD spread. All of Connecticut poultry were free of Avian Influenza.

Ongoing diagnostic testing services dealt with 93,167 samples including avian and mammalian serology, microbiology, pathology and mastitis. In addition, education efforts for veterinarians and their clientele were able to reach over 1,300 veterinarians and other health professionals for Lyme Disease.

In the area of emerging infectious diseases a research project addressed egg-borne Salmonella enteritidis infection, which has emerged as a major public health problem in the U.S. Efforts resulted in the identification and characterization of SE specific attachment proteins that will help to design effective control measures.

Animal production efficiency issues were addressed through a variety of studies affecting the dairy industry. Research activities evaluated the economic impact of rBST use on dairy farms in the state and enabled producers to better assess the benefits of rBST use. A statewide survey revealed that Connecticut residents strongly support the preservation of farmland statewide, and a Fund for Rural America funded study better clarified current and long term issues related to maintenance and enhancement of Connecticut dairy farmers.

Highlights in this goal area included the cloning of the first calf from an adult cow in the United States and the cloning of a bull after long-term culture. The College's Transgenic Animal Facility has several collaborative research projects with leading international animal

companies. Research areas include both basic and practical research. Considerable media attention and keynote presentations throughout the world have resulted from these efforts.

Involvement by College faculty in a major lobster mortality event in Long Island Sound enabled researchers to identify a parameoba parasite in the neural tissue of lobster as the disease affecting lobster decline. College activity in this issue contributed to congressional involvement in emergency relief actions as well as state level efforts through leadership by the Governor. Additional research funds were attracted for continued efforts in this area.

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 efforts to clone a calf from an adult cow.

In summary, our 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	242,568	4.774
Hatch	105,171	2.330
Multi-state research	125,702	3.320
State funds	6,443,775	120.292
Competitive grants	651,553	20.718
McIntire-Stennis	---	---
Total	7,568,769	151.434

\*These figures do not include an average 32% fringe rate.

## Connecticut Annual Report of Accomplishments FY2000

### Goal 1 - An Agricultural System that is Highly Competitive in the Global Economy

#### Key Theme - Biotechnology

- a. Activity - A research project used traditional breeding procedures in combination with biotechnological procedures for the development of new and valuable ornamental plants. New plants such as *Torenia fournieri* 'UConn White' and the Constitution Series of *Alstroemeria*, 'Patriot\_', 'Redcoat\_', 'Liberty\_', and 'Freedom\_' have been introduced. Most recently, the only fragrant *Alstroemeria* in the world, 'Sweet Laura\_' has been introduced; this cultivar not only is fragrant but is winter hardy to USDA zone #5.

ConnectiCulture, a nonprofit plant micropropagation service facility, was created at the University of Connecticut's College of Agriculture and Natural Resources to provide a way to expeditiously propagate and distribute new plants for release.

- b. Impact - The growing interest in new plant development for commercial introduction has resulted in considerable funding and a large number of requests for information and presentations relating to this program. In addition, the presence of ConnectiCulture and its services that it offers has encouraged state leaders to participate in our programs. Our programs are excellent educational tools that also provide products, information and services for the entire state.
- c. Source of Federal Funds - State funds/Grant funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Emerging Infectious Diseases

- a. Activity - A research project addressed egg-borne *Salmonella enteritidis* infection, which has emerged as a major public health problem in the United States and several other countries during the past decade. An essential event in the pathogenesis of SE is the attachment to the host intestinal mucosa through specific receptors on the host cell surface. The project is in the process of molecular characterization of the mechanism of attachment by identifying and studying the adhesion molecules expression during attachment of SE to host cell receptors. Identification of four SE proteins of approximate size 85, 75, 50, and 36 Kda newly synthesized when incubated with Int-407 cells (human intestinal cells).
- b. Impact - Identification and characterization of SE specific attachment proteins (adhesions) would help to design effective control measures. Further studies are in progress.

- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Animal Genomics

- a. Activity - College scientists cloned the first calf from an adult cow in the U.S. and cloned a bull after long-term culture. The College's Transgenic Animal Facility has several collaborative research projects with leading international animal companies. Research areas include both basic and practical research in the areas of reproductive physiology and animal biotechnology, particularly cloning and transgenic technology.
- b. Impact - Research was supported through the successful attraction of over \$5,000,000 extra-mural supports from the USDA, the State of Connecticut (CII), the Rockefeller Foundation, and the pharmaceutical industry, such as Alexion, Biotechnology Research and Development Corporation (BRDC), PPL Therapeutics and Genzyme Transgenic Corporation etc. About 30 peer-reviewed papers (6-8 papers/year) were published in the last 4 years at UConn. In 2000, two papers were selected as the cover paper in two prestigious journals: Biology of Reproduction (cover issues of January to June 2000) and the Proceedings of the National Academy of Sciences (PNAS, the February 1, 2000 issue). Because the scientific achievements in cattle cloning, Dr. Yang has been invited as a keynote, featured or seminar speaker (about 80 since 1997) at many scientific conferences or educational institutions around the world. Recent success on cattle cloning (announced in June 1999 and January 2000) has been covered extensively by various news media around the world. These publicities include The CNN Headline News, BBC News, NPR News, The New York Times, The Washington Post, The Wall Street Journal, The US News & World Reports, The Chicago Tribune, The Boston Globe, London Times, Associated Press, Reuters, Agency France Press, China Press and Xinhua News Press, etc.
- c. Source of Federal Funds - Hatch
- e. Scope of Impact - State specific/CT

#### Key Theme - Plant Genomics

- a. Activity - The rhododendron crop produced in Connecticut may be valued at as much as \$75 million. A root rot disease caused by the fungus *Phytophthora cinnamomi* causes significant plant death and requires application of fungicides to control disease incidence. Costs associated with *Phytophthora* root rot may exceed \$10 million annually in Connecticut. More efficacious, cost effective and environmentally friendly ways of controlling rhododendron root rot are needed. Created transgenic rhododendrons carrying an antifungal gene that should make plants resistant to the root rot disease, as well as other common rhododendron diseases. Developed a diagnostic assay employing

the polymerase chain reaction (PCR) that will accurately determine if plants are infected with *Phytophthora cinnamomi*. Developed a system for regenerating and transforming rhododendron tissue using microprojectile bombardment (gene gun). Created several transgenic rhododendrons that have shown resistance to *Phytophthora* in vitro. In the process of testing the resistance of these plants to root rot in the greenhouse.

- b. Impact - Too early to bring either root rot resistant rhododendrons or a phytophthora diagnostic assay to the nursery industry. However, progress has been encouraging and suggests success. Resistant plants could nearly eliminate the need for chemical controls for root rot in rhododendron.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Urban Gardening

- a. Activity - Bridgeport, CT, is one of the poorest cities in the nation and is the third poorest in Connecticut. Many residents suffer from poor nutrition, and are unable to secure nutritional food at reasonable prices. An urban gardening program was implemented by Extension faculty that was focused on the empowerment of limited-income residents through development of 14 community gardens serving over 200 individuals representing the Bridgeport Boy's Village, South End Center, Bridge House for the disabled and Stepping Stone homeless shelter.
- b. Impact - Gardeners are using less chemical products due to increased pest control knowledge, increased knowledge about appropriate crop selection (cool versus warm season crops), and are able to identify beneficial insects and their affect on plant growth. The gardens served to foster a spirit of cooperation, sharing and good will by eliminating neighborhood blight caused by vacant, abandoned lots and created a safe environment for children in the community.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Ornamental/Green Agriculture

- a. Activity - Floriculture crops represent 11% of crop agriculture in the USA, and they have been the most rapidly expanding segment of crop production. Research was conducted to ascertain causes of certain post harvest problems in poinsettia bract disorders caused by a pathogen, *Botrytis cinerea* and an abiotic disorder related to nutrient stress. Basic information was gained that better identified causes of certain post harvest problems.

- b. Impact - Research results will assist in the industry's ability to better manage post-harvest disorders, thereby improving marketability and cost returns to the industry.
- c. Source of Federal Funds - Smith-Lever 3 b and c/Hatch
- d. Scope of Impact - Integrated research and extension/CT

#### Key Theme - Aquaculture

- a. Activity - The Connecticut Interagency Aquaculture Coordinating Committee identified the transfer of the former UConn Marine Research Laboratory in Noank as a step to aid public/private aquaculture and resource enhancement by creation of an experiment station type, Aquaculture Innovation Center. CES faculty convened two meetings to help organize participants and attract substantial private interest (Legal Seafoods). In addition, several hundred acres of seabed are being utilized for culture ("aquatic agriculture") including expanded Mohegan usage and the employment and local stock enhancement capabilities have increased tenfold. The shellfish aquaculture policy issues (sea-bed leasing, departmental authority, hatcheries, dredging impacts) are being evaluated by key CES individuals in Rhode Island and New York, with substantial input from the "model" Connecticut shellfish program.
- b. Impact - If fully developed, potential dollar values of the cooperative might approach \$1.5 million, provided facility support is achieved. The eastern end of Long Island Sound has the potential to produce quantities of high quality shellfish (clam, oyster, scallop, mussel, steamers) of considerable commodity value (i.e. \$90/bushel).
- c. Source of Federal Funds - State funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Aquaculture

- a. Activity - critical lobster mortality attracted intense media coverage in newspapers and on TV throughout the northeast. The issue of a grim ecological "signal" and extensive marine life destruction raised several questions on the cause. College scientists identified a parameoba parasite in neural tissue of lobster as the disease and recorded data substantiating the lower catches and biological impacts at sea. Congressional aids were invited on the at-sea investigations and together with DEP data, presented a case for emergency relief to Governor Roland and the Secretary of Commerce. A major conference on the lobster mortality, April 17 & 18, 2000, Stamford, Connecticut, involved 350+ agency representatives, industry, and scientists to document the chronology/geography of the event, and to plan scientific research necessary.

- b. Impact - The conference generated considerable exposure of the issue and appropriation of funds through Congress to assist in research efforts to address the lobster die-off issue.
- c. Source of Federal Funds - Smith-Lever 3 b and c/Hatch
- d. Scope of Impact - Integrated research and extension/CT

#### Key Theme - Aquaculture

- a. Activity - Protozoal pathogens cause important mortalities that seriously affect the success of oyster aquaculture in Connecticut and elsewhere. The development of the disease appears to be related to ineffective defense mechanisms. Research aimed at developing assays to evaluate immune defense mechanisms in the oyster resulted in the development of two repeatable and sensitive assays to quantify important and relevant immune functions in oysters, phagocytosis and respiratory burst.
- b. Impact - This will provide new tools to better understand, and maybe some day control, the mechanisms of development of those diseases. There is potential that the tools we developed will result in better understanding of diseases that may kill up to 90% of the harvest for oyster aquaculture. A better understanding of oyster disease may in turn lead to measures to control the diseases, which may benefit the whole oyster aquaculture industry.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Aquaculture

- a. Activity - Epitheliocystis is an infectious communicable disease of fishes that has recently caused losses of as many of 500,000 salmon smolts in salmon farms in Ireland. The estimated financial loss is one-half million dollars or more. Research focused on characterizing the microorganism associated with epitheliocystis in farmed salmon.
- b. Impact - Histopathologic and ultrastructural evidence demonstrates that this agent causes a severe proliferative gill infection in salmon, and that this agent has ultrastructural features of a chlamydia, an obligate intracellular bacterium.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Animal Production Efficiency

- a. Activity - The current economic climate for dairy farmers in Connecticut is tight, thereby requiring close economic evaluation by producers before adoption of new technologies. Use of rBST for use on dairy farms is such a current concern. Researchers conducted an economic evaluation and were able to provide key empirical data to dairy farmers on the economics of rBST use on Connecticut dairy farms. Reported that Connecticut farmers are not making significant positive profits at current prices from adopting rBST.
- b. Impact - The state dairy farmers are now making more informed decisions about rBST use for agricultural profits. In this case the research provides the dairy farmers with better knowledge of the technology's profitability, data that was only available otherwise from the manufacturer.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact – State specific/CT

#### Key Theme - Animal Production Efficiency

- a. Activity - A need exists to identify ways to improve the economic viability of dairy farmers in Connecticut with attention to issues of agricultural profitability and efficiency, environmental stewardship and rural community linkages to agriculture. A survey of Connecticut dairy farmers was completed with a 50% response rate. The results suggest that while 80% of all dairy farmers in the state expect to be in business five years from now, only 57% of farms with less than \$100,000 in total receipts believe they will be in existence five years in the future.
- b. Impact - Survey fact sheets are being prepared and reviewed. A briefing session for Connecticut policy makers was held in December 2000.
- c. Source of Federal Funds - Fund for Rural America/Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Animal Production Efficiency

- a. Activity - Livestock farmers are often deep in debt, receiving wholesale prices insufficient to cover production costs. Extension faculty worked with participating farmers to complete a business plan, thereby allowing strategic decisions to be made regarding the output and price needed to meet goals.
- b. Impact - After completing a budget for a specific agricultural enterprise, several Eastern Connecticut producers pursued retail markets for higher product prices, alternative



enterprises with higher profitability, or invested in technology to improve efficiency of production.

- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Animal Production Efficiency

- a. Activity - The animal rights movement has gained momentum in the last twenty years and has been successful in making in-roads into the elementary schools. College faculty educated poultry farmers, 4-H youth and leaders, extension educators and the general public about the animal welfare/rights issue. Information on humane methods of poultry production was disseminated at group meetings, by newsletter articles, and individual contact. More than 250 youth and adults attended various functions and learned more about the welfare of poultry and animals.
- b. Impact - More than 100 4-H youth are rearing poultry in a more humane way as a result of our programs on welfare, management and health. 87 youth who exhibited and did showmanship at the CT State 4-H Poultry Show and Showmanship contest demonstrated a greater understanding of husbandry practices.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Animal Health

- a. Activity - Infectious bronchitis is an acute, highly contagious respiratory and urogenital disease of chickens. The highly transmissible nature of the disease suggests that use of a vaccine is necessary to prevent outbreaks. New concepts for developing novel vaccines are needed. S1 protein has been demonstrated to be the major inducer of protective immunity, although other structural proteins also play a role. Research focus was on development of IBV recombinant fowl pox vaccine. Have cloned S1 subunit of spike protein sequence of IBV Massachusetts serotype in the attenuated Fowlpox virus vector for possible vaccine against IBV infection.
- b. Impact - Successful development of a recombinant DNA vaccine for Infectious Bronchitis virus, with trials under way to test the efficiency of the vaccine against infectious bronchitis virus infection in chickens.
- c. Source of Federal Funds - Multi-state Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Animal Health

- a. Activity - Virus research and virus vaccine research are targeted at present vaccines for PRRS - a swine disease affecting the industry. DNA vaccines encoding the pseudorabies virus and porcine reproductive respiratory virus genes. The use of cytokines such as IL-2 as DNA vaccine adjuvants is an area of active research, along with cytokine bioassay development. The adjuvanticity of swIL-2 for DNA vaccines will be tested in swine in the context of protective immunity against PRRS.
- b. Impact - Achieving an effective vaccine against PRRS will have a positive impact in production and productivity of the swine industry. A DNA vaccine carrying PRRSV ORF-5, which appears to be functional in mice, has been constructed. Swine IL-2 cloning is under way. Previous work in our laboratory with a DNA vaccine carrying pseudorabies virus IE180 gene that was adjuvanted with IL-2 has served as preliminary data for a large grant submitted to USDA, which is currently under review. The application of IL-2 as an adjuvant for DNA vaccines in swine will be a good contribution in vaccinology for this species.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Animal Health

- a. Activity - Poultry pests increase the risk of disease in poultry and thus need to be controlled. Flies and rodents from farms may enter neighboring properties and cause nuisance or health problems for the non-farm community. Poultry pests reduce profitability by contamination of feed, spreading of disease and destruction of property, and are therefore necessary to control. As insecticides and pesticides are added and removed from the marketplace, producers need to know about the products and how to safely use them. Our focus is to educate poultry farmers about proper pest management. The integrated pest management approach is used. This includes natural, social, physical and chemical pest control methodologies.
- b. Impact - Reduced fly and pest populations were noted due to better pest management by CT and New England poultry producers. Savings ranging from \$100 to \$5,000 were reported by farmers resulting from decreased loss due to pests. Thirty-eight poultry farmers/workers/allied industry personnel said they learned new information on pest control and safe use and handling of pesticides. Seven allied industry people said they increased their knowledge about poultry pests and IPM as a result of Extension Programming.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

## Key Theme - Animal Health

- a. Activity - Veterinarians and their clientele need diagnostic testing services to aid in diagnosis of both common and emerging animal and zoonotic diseases of local importance. An active state and regional veterinary diagnostic laboratory is also a critical component of an emergency preparedness program for animal diseases as well as for natural and man made disasters. Examples include study and test development in the areas of Equine and Bovine Lyme disease, West Nile Virus Encephalitis, Equine Ehrlichiosis and diseases affecting lobster and shellfish. The CT Veterinary Diagnostic Laboratory provided analysis of approximately 93,167 samples, including avian and mammalian serology, microbiology, pathology and mastitis. In addition, the laboratory is involved in emergency preparedness planning with the CT Dept. of Agriculture, including response to animal and zoonotic disease emergencies, natural disasters, and planned response to potential bioterrorism threats.
- b. Impact - Approximately 1,000 veterinarians and approximately 300 other health professionals became more knowledgeable about Lyme Disease as a result of formal continuing education presentations. Impact of this education is demonstrated by submission of more samples and requests for the most appropriate test for the particular situation to the Diagnostic Testing Laboratory.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

## Key Theme - Animal Health

- a. Activity - There is a need to monitor poultry and other birds' diseases through an effective surveillance program. Faculty conducted postmortem, histopathological and bacteriological examinations of poultry and pet birds. Visited poultry farms to discuss health and poultry management with poultry producers to prevent further losses due to diseases. Answered telephone calls (600) from poultry, pet bird and game bird farmers. Provided information on current poultry vaccination and medical treatment programs for various viral and bacterial infections.
- b. Impact - Outbreaks of ILT and infectious bronchoitis infection were successfully controlled by proper diagnosis and biosecurity and vaccination programs. Total egg laying commercial flocks of 3.5 millions were protected from the spread of IBVD, Coryza, Colibacillosis and Pasteurellosis. Grandparent Broiler breeder flocks of 8,000 birds were protected from ILT and Mycoplasma outbreaks. Constant surveillance of poultry diseases provides a more nearly disease-free area for the production of quality products in Connecticut. No outbreaks of Salmonella food-borne outbreaks related to eggs and egg products from the Connecticut commercial Egg farms. So far all poultry in Connecticut are free of Avian Influenza.

- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Home Lawn and Gardening

- a. Activity - There is a strong public demand for current, unbiased, accurate information on all phases of gardening including pest/problem identification and control, cultural information, and plant section. The Home and Garden Education Center and the associated Master Gardener Program educated the public in formal presentations and through a variety of responses. 188 students were enrolled in the Master Gardener Program. Six issues of the Home and Garden News were published with contributions coming from many of the Departments of the College of Agriculture and Natural Resources. The Advanced Master Gardener Program was initiated and proved successful with 15 classes given.
- b. Impact - 15,000 in-office and telephone contacts with members of the public were made by Master Gardeners resulting in diagnosis of a wide variety of plant problems (insects, plant identification, etc.). 56 formal presentations and radio/television and newspaper segments reached another 434,290 state residents. Collaborative partnerships for community-based education projects were made with 132 community groups and organizations across the state, including historical organizations, social service agencies, residential group homes, etc. Of the 188 students enrolled in the Master Gardener program, 180 (96%) completed 65 hours of in-class instruction and at least 60 hours as interns in the Extension Centers and/or community
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - GIS/GPS

- a. Activity - Remote sensing and related technologies like geographic information systems are powerful tools to acquire and analyze information about the landscape. However, further development is needed so that land use planners and decision makers concerned about the impact of sprawl on their communities can access and utilize this information. The NASA-funded NAUTILUS Project distributed a package of materials to each middle and high school in Connecticut, in conjunction with National Geography Awareness Week (November 15-19, 1999) and GIS Day (Friday, November 19). The package included a poster titled "Connecticut's Landscape", a list of suggested questions and answers pertaining to the poster, a political map of Connecticut, a fact sheet on National Geography Awareness Week, a brochure titled "Understanding Connecticut's Landscape," and a NAUTILUS Project fact sheet.

- b. Impact - The “media event” drew much attention and resulted in several pieces being written in newspapers and newsletters, including: “New satellite map of state unveiled at RHAM,” “UConn Presents RHAM with satellite-made map,” “Remapping state's landscape,” and “NASA- funded center provides data for town planners.” Goals of this RESAC’s outreach activities is to increase students’ awareness of the exciting developments in space technologies, especially as they pertain to understanding the communities within which we live.
- c. Source of Federal Funds - Hatch/Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

Key Theme - GIS/GPS

- a. Activity - A research team quantified the effect of broadleaf canopies towards the degradation of survey-quality GPS measurements. This research included a comparison of the Soviet GLONASS system and the U.S. GPS system.
- b. Impact - The result developed a regression documenting the degradation of accuracy as a function of percent sky obstruction. These data are useful to surveyors and mappers so that they can anticipate what accuracy they can expect from their equipment in less than perfect conditions. The study resulted in a poster presented at the American Society of Photogrammetry and Remote Sensing (May 2000, Washington, DC) and two papers (one in the proceedings of the American Congress of Surveying and Mapping, one in a peer-reviewed journal).
- c. Source of Federal Funds - State funds/Grant funds
- d. Scope of Impact - State specific/CT

## Connecticut Annual Report of Accomplishments FY2000

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

The Connecticut program was particularly active and successful in this area with a wide variety of efforts conducted during the reporting period. In the critical area of food safety, Extension education activities in Hazard Analysis Critical Control Point (HACCP) systems were significant, with a variety of HACCP training programs offered during the reporting period. 40% of survey respondents who attended HACCP courses implemented a HACCP plan as a result.

Extension work in the area of foodborne pathogen protection efforts related to biosecurity on dairy farms resulted in education of Extension personnel from throughout the northeast U.S. This regional educational approach enabled Connecticut educators to better inform dairy producers about means and methods to ensure that high quality products leave the dairy farm for human consumption. Extension education programs in food security issues were targeted to 255 staff and volunteers from agencies that deal with Food Stamp recipients and other food programs across Connecticut. This effort increased networking opportunities for emergency food providers and supplied them with knowledge of new ways to use foods traditionally found in food pantries as well as produce donated by Connecticut farmers.

A particular highlight in this goal area included research conducted to develop and apply DNA based Polymerase Chain Reaction (PCR) for avian and food-borne pathogens. A PCR for reovirus, adenovirus and a multiplex PCR for avian pathogenic mycoplasmas were successfully developed. In addition, a PCR for food-borne pathogens such as *Salmonella* spp. and *Campylobacter* spp. was developed and is being evaluated.

Benefits to clientele and stakeholders who participated in this goal area were many; including new protection methods for dairy producers, effective HACCP plans for producers of value-added products such as cheese and apple cider, and enhanced opportunities to utilize surplus foods for those in need.

In summary, our 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 2		
Funding Source	Expenditures*	FTEs
Smith-Lever	158,221	3.234
Hatch	7,765	0.180
Multi-state research	7,376	0.170
State funds	765,242	12.738
Competitive grants	---	---
McIntire-Stennis	---	---
Total	938,604	16.322

\*These figures do not include an average 32% fringe rate.

## Connecticut Annual Report of Accomplishments FY2000

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

#### Key Theme - Food Safety

- a. Activity - Federal agencies have targeted food processors and producers with food safety guidelines and regulations. Connecticut has identified the need for a consumer education focus operated through a central location. A telephone survey of 211 CT residents revealed that 65% had concerns about food safety. Participants desired more information on food preparation, (27%), food storage (27%) and food preservation (14%). 55% of respondents stated that they would use the Internet as a source of food safety information. Fact sheets (30) have been developed and a web site completed.
- b. Impact - The project's activities to develop a web site, library, fact sheet series, and training programs will result in the creation of a framework for training programs and utilization of the Home and Garden Education Center to provide food safety education resources to Connecticut residents.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Foodborne Illness

- a. Activity - Research was conducted to develop and apply DNA based Polymerase Chain Reaction (PCR) for avian and Food-borne pathogens. We successfully developed PCR for reovirus, adenovirus and a multiplex PCR for avian pathogenic mycoplasmas. A multiplex PCR is also developed for serotype Massachusetts and Arkansas infectious bronchitis virus (IBV). PCR for Food-borne pathogens such as Salmonella spp. and Campylobacter spp. have been developed and being evaluated. A quantitative PCR was developed which can detect nine species of spoilage bacteria and also quantitate the bacterial load in the spoilage meat. Proteus mirabilis specific PCR is developed and standardized. This P. mirabilis specific PCR was able to detect 18 strains of P. mirabilis, but not from other Protease species and bacteria. The minimum amount of target DNA detected by this PCR was 10 fg in gel system.
- b. Impact - Development of a Multiplex PCR for avian respiratory diseases.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

### Key Theme - Foodborne Pathogen Protection

- a. Activity - Biosecurity on dairy farms has increased in importance in order to maintain and ensure that a high quality product leaves the farm for human consumption. Information has been delivered through extension talks directly to dairy producers and to extension personnel that will be working directly with dairy producers. Through the Northeast Dairy Extension group of the Mid-Atlantic Kellogg Consortium training materials were provided to 80 participants from throughout the northeast via CD-ROM and a notebook for their programming needs. A biosecurity brochure for dairy producers in Connecticut was developed and presented to 45 producers and support personnel who attended a biosecurity workshop in Western Connecticut.
- b. Impact - Materials provided by the regional in-service workshop have been used by at least 10 educators for dissemination of information to dairy producers throughout the Northeast. In the biosecurity workshop in Connecticut, the dairy producers were interested in biosecurity issues and many have implemented at the recommended practices on the farm. This is in contrast to the lack of interest in this topic several years ago.
- c. Source of Federal Funds - Hatch/Smith-Lever 3 b and c
- d. Scope of Impact - Multi-state integrated research and extension/Northeast U.S. states

### Key Theme - HACCP

- a. Activity - 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 our food system, Hazard Analysis Critical Control Point (HACCP) systems have become the food safety system of choice for the food processing industry. Extension faculty coordinated and/or participated in HACCP training efforts for seafood and meat and poultry since 1997. Participants in the training programs gained skills needed to develop a HACCP plan so that they are in compliance with the regulations. In addition, we respond to requests by other food industries to provide HACCP training. Three meat and poultry HACCP workshops were provided, two to New England small processors (58 attended) and one to regional FSIS regulators (25 attended). A small cheese processor HACCP workshop (12 attended) was provided at the request of the CT State Dept of Agriculture and the CT Cheese Society. Provided one-on-one training in HACCP for a pilot project Apple Cider processors (19 pilot sites). A HACCP manual is in production for Apple Cider.
- b. Impact - 40% of survey respondents who attended courses had implemented a HACCP plan; two reported that they were ready to implement a plan, and five stated that they were going to implement in the next few months. Six reported that the course we offered was instrumental in the success of developing and implementing a HACCP plan. A booklet was published that is now being used by



many meat processors throughout New England in the development of their HACCP plans. All Cheese program participants rated the workshop as good-excellent. 84% learned or realized something new. 93% reported that the workshop would help them to implement HACCP.

- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - Multi-state extension/New England states

#### Key Theme - Food Handling

- a. Activity - The food industry is a major industry in Connecticut. A survey to the Connecticut food processors was conducted to appraise the interests of the Connecticut food processors, help to identify the needs of Food Science Extension education statewide and determine potential applied research programs to assist the Connecticut food industry to compete nationally and internationally, build significant collaborations between UConn food science faculty and food processors, and promote UConn undergraduate and graduate education in food science. 350 Connecticut food processors were identified and included in the Connecticut food industry survey, 100 food processors responded to the survey through 3 runs of the survey.
- b. Impact - Small food processors recognized the UConn food science program through the survey and have contacted PIs at UConn for assistance in their product development, safety enhancement, and quality improvement. Additionally, by learning the existence of food science program in UConn, food companies have contacted UConn showing their interests to hire Food Science graduates, and topics of future workshops and short courses for Connecticut food processors were identified.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Food Security

- a. Activity - The Food Security component of the CT Family Nutrition Program (FNP) is designed to provide food and nutrition education to Food Stamp recipients who also receive food from emergency food programs such as soup kitchens, food pantries, and homeless shelters. In order to have a greater impact on the quality of food and food choices of recipients, FNP staff also conduct workshops with staff and/or volunteers of participating agencies and organizations. FNP Food Security further strengthened working relationships with emergency food providers, regional food banks and hunger outreach program staff to provide expertise in training on food safety and nutrition. Staff worked with over 30 agencies in 14 towns and cities throughout the state reaching 255 staff and volunteers, over 400 clients in hands on workshops, and over 1,000 at health

fairs. They also distributed over 5,000 copies of educational materials ranging from information on turkey safety and recipes to the USDA Food Guide Pyramid and a bi-lingual cookbook featuring recipes and information on using locally grown vegetables. A mini-conference, “Starting from Scratch” attracted over 35 staff from 30 different agencies.

- b. Impact - Networking opportunities have increased for emergency food providers. Staff and recipients have learned new ways of using foods traditionally found in food pantries, plus ways of increasing the variety and nutritional value of the foods served or provided to families and to help agencies and families learn how to use produce donated by Connecticut farmers.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

## Connecticut Annual Report of Accomplishments FY2000

### 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 efforts were implemented in the area of human nutrition. Research on carotenoids as a dietary source of vitamin A will help support health of the general population through better understanding of intestinal absorption of carotenoids. 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.

Research on the molecular actions of thyroid hormone as it affects fat synthesis and interaction with zinc resulted in the cloning and sequencing of a region of a key enzyme for fat synthesis in the acetyl-coA carboxylase gene. Research to better understand the mode of action of soluble fiber and how it may reverse hyperlipidemia evaluated potential differences in response between men and women. Results will permit a more accurate dietary recommendation to hyperlipidemic individuals who are at risk for coronary heart disease.

Extension education programs in the area of human nutrition were numerous. The Expanded Food and Nutrition Education Program (EFNEP) provided community outreach and education to 682 EFNEP homemakers representing 2054 family members and 1099 children. Program participants realized significant improvements in diets and food-related behavior, with reduced allocation of funds for food purchases.

Education efforts for health care system providers in Hartford focused around the prevention, treatment, and follow-up of anemia. This program resulted in many clinicians anxious to talk and learn about anemia. 86% of health care professionals that diagnose anemia in Hartford volunteered for an interview, reflecting the importance these providers place on addressing the issue. The 4-H Double Dutch Youth curriculum served as the focus of promotion of Healthy People 2010, a program supporting health promoting policies in the community. A considerable increase in knowledge of nutrition by participating youth and parents was demonstrated.

A study of impacts on the spatial distribution of cancer in the vicinity of the Connecticut Yankee Nuclear Power Plant determined that there was no detectable effect of the plant on cancer incidences. A report has been submitted to the Connecticut legislature. Education about lead poisoning, a serious but preventable health problem, was offered through several educational programs for children, childcare providers and renovators within the Hartford region as well as for various tribal nations from elsewhere in New England. A pilot program for children was adopted for system-wide use in the Hartford school system.

A particular highlight in this goal area included research to ascertain the presence of human cases of encephalitis in dead crows in southern New York and Connecticut. A demonstration of the presence of West Nile virus in 18 towns within southwestern Connecticut provided a guide for the CT DEP and Public Health officials in introducing limited mosquito control spraying. No human cases occurred in the state. Considerable favorable publicity was realized by faculty in the College for the role they played, including documentation of the first recovery of West Nile virus in North America being published in Science (1999: 2331-2333).

Another research highlight included work on docosahexaenoic acid (DHA) that was designed to assess the role of foods with DHA on sleep patterns of newborns. DHA is commonly found in cold water fish such as salmon, herring, and tuna. Results indicated the need for pregnant mothers to consume cold water marine fish as a means to meet the increased need for DHA during pregnancy and will be useful in making dietary recommendations to pregnant women.

Another highlight of the reporting period was the Connecticut Family Nutrition Program for Infants, Toddlers and Children (FNP-IT). The program reached over 200,000 Hispanic adults in Hartford by disseminating the USDA FIGHT BAC! campaigns through television, radio and newspapers. An additional 10,000 target individuals were provided with FIGHT BAC! stickers and pamphlets at health fairs and supermarkets in Hartford.

Benefits to clientele and stakeholders who participated in this goal area were many; including the protection of hundreds of thousands of residents of southwestern Connecticut from West Nile Fever, improved opportunities for new born infants, protection of young people from lead poisoning, and better knowledge of nutrition needs by low income inner-city residents.

In summary, our 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	358,293	8.023
Hatch	7,765	0.18
Multi-state research	7,376	0.17
State funds	1,006,464	15.386
Competitive grants	373,746	9.844
McIntire-Stennis	---	---
Total	1,753,644	33.603

\*These figures do not include an average 32% fringe rate.

## Connecticut Annual Report of Accomplishments FY2000

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

#### Key Theme - Human Nutrition

- a. Activity - Carotenoids (beta-carotene and related compounds) are important as dietary sources of vitamin A and also as antioxidants for humans and for animals. A significant fraction of the U.S. population is now consuming dietary supplements of vitamin E and beta-carotene, and some are consuming supplements of other carotenoids such as lycopene. Research is underway to determine interactions among these fat-soluble nutrients (enhancement of or interference with intestinal absorption) in three areas. Health implications for the elderly, estimation of human vitamin A status, and improved methodology such as the isotope-dilution method and the relative dose response.
- b. Impact - Research results in this area will support health of the general population by continuing to focus on factors which affect intestinal absorption of carotenoids and on the mechanisms by which tissues take up and use carotenoids and vitamin A compounds.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Human Nutrition

- a. Activity - Researchers are focusing on the effects of various forms of exercise interventions on protein utilization in young, healthy non-obese children. As a follow up to studies done to assess the effects of reduced calorie diets and exercise (walking) on protein metabolism during weight loss in obese children aged 8 to 10 years, a series of exercise interventions were conducted with non-obese children. Because an increase in physical activity has been recommended for this age group, regardless of body weight issues, it is important to understand the implications of exercise training on protein utilization in growing children.
- b. Impact - Characterization of the relationship between energy intake (diet), energy expenditure (exercise), and protein metabolism in obese and non-obese children will provide a scientific foundation for the development of guidelines for the management of pediatric obesity as well nutritional recommendations in support of exercise and growth in healthy children.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

## Key Theme - Human Nutrition

- a. Activity - Nutrition Education has been identified as a need in Connecticut. Recent survey results of Connecticut teachers indicated a strong need for additional nutrition resources that are easily accessible and grade/age appropriate. Teachers also expressed a need for materials and education in the area of food safety. A nutrition education web site was developed that is targeted to school food service personnel, teachers, students and parents. An interactive nutrition education game aimed at school children grades 4-8 was uploaded to the site. Culinary training for school food service directors for over 40 school food service directors and managers was conducted to learn how to implement SMI in their programs. A nutrition resource guide for teenagers was accepted for publication by Bull Publishing in Palo Alto, CA. A scholastic curriculum for grades 3-5 emphasizing healthy eating and physical activity, over 100 teachers participated in this training, done in collaboration with the Newspaper in Education Council here in Connecticut and 180 school food service personnel and CACFP personnel completed the qualified food operator course in food safety and sanitation.
- b. Impact - Activities already conducted, combined with planned activities in the areas of distance education for food service personnel and new undergraduate curriculum, will better position the teaching profession and food service providers to better serve the public. Positive results include presentations at two statewide meetings of the Connecticut Chapter of the American Association of Family & Consumer Science Teachers and Connecticut Association of Physical Education, Health, Recreation and Dance, abstracts presented at various national and regional meetings, a book submission "Fueling the Teen Machine," teacher training for elementary school teachers on "Food Works."
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

## Key Theme - Human Nutrition

- a. Activity - Connecticut has the highest per capita income in the nation but unfortunately the poverty rankings are just as high. For example, among 200 U.S. cities with more than 100,000 residents, Hartford ranks 6<sup>th</sup> in the percentage of children living in poverty (43.8 %). Poverty is correlated to the issue of hunger and homelessness.

The Expanded Food and Nutrition Education Program provided community outreach and nutrition education to low income families. Programs were provided in community locations and help to assess and improve food practices and behaviors through interactive education. EFNEP provided knowledge and skills that help families build on strengths and become independent and self-sufficient. Staff reached 682 EFNEP homemakers representing 2054 family members and 1099 children. 57% of the homemakers "graduated", or completed 4 or more lessons and showed an improvement in diet or food-

related behavior. In this population, the majority participated in USDA federal food assistance programs such as Food Stamps or WIC. 27% were Black, 27% White, 44% Hispanic, and 1% each Native American and Asian. 83% live in larger metropolitan areas. 64% had incomes at or below 75% of poverty. Over 2,200 youth were also reached 79% in urban/suburban areas. 39% were Black, 27% White, 33% Hispanic, and 1% Asian.

- b. Impact - Evaluation of the diets of the adult homemakers before and after nutrition education showed an overall improvement by 94% of the participants. Results also show that participants were able to improve their diets while spending less money on food per capita per month. On average, families spent \$83.10 per person per month before participation, and \$73.80 after EFNEP intervention.
- c. Source of Federal Funds - Smith-Lever 3 d (EFNEP)
- d. Scope of Impact - State specific/CT

#### Key Theme - Human Nutrition

- a. Activity - With Connecticut having some of the poorest urban populations in the U.S. there is need to provide nutrition and food safety education to Hispanic population and other low-income groups. The Connecticut Family Nutrition Program for Infants, Toddlers and Children (FNP-IT) provided nutrition and food safety in Connecticut. Targeted individuals were reached through mass media, school-based education, and health fairs and community agency presentations. FNP-IT continues to operate as a most successful partnership between UConn's College of Agriculture and Natural Resources (Department of Nutritional Sciences and The Cooperative Extension System) and the Hispanic Health Council, Inc. in Hartford, Connecticut.
- b. Impact - FNP-IT reached over 200,000 Hispanic adults by disseminating the USDA FIGHT BAC! campaign through television, radio and a popular Hispanic newspaper. 2,000 children were reached through a food safety puppet show produced by FNP-IT and delivered at public elementary schools in Hartford and East Hartford. Close to 10,000 target individuals were provided with FIGHT BAC! stickers and pamphlets at health fairs and supermarkets in inner city Hartford. FNP-IT reached over 50,000 target individuals with a food access campaign delivered through radio, bus signs, bus stop shelters, and a newspaper ad.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

### Key Theme - Human Nutrition

- a. Activity - Well-child care and outreach programs were directed through the health care system in Hartford, CT. The primary focus was around the prevention, treatment, and follow-up of anemia. The program heightened awareness of parents and health care providers to the problem of anemia by documenting that 1 in 3 18-36 month old children could be classified as anemic. Faculty developed a collaborative working group of health care providers, university departments, city and private agencies, and the CT WIC program to address the problem of anemia. They extensively described the perception, diagnosis, and treatment of anemia in the three primary care centers in Hartford. This effort better portrayed parent perceptions of anemia and its treatment from a qualitative analysis of parent interviews and focus groups, began description of Head Start and WIC perception to prevention, diagnosis, treatment, and consequences of anemia.
- b. Impact - Many clinicians were anxious to talk about anemia in the context of the population they serve, and noted that assumptions driving care delivery hindered discussion about anemia. Efforts continue to analyze and discuss information from the provider and caretaker qualitative studies, complete presenting the chart review data with providers, caretakers, and agency personnel, work with collaborating agencies on the formats for intervention and provide waiting room education programming. Eighty-six percent of all attending physicians, residents, and nurse practitioners that diagnosis anemia in Hartford primary care clinics volunteered for an interview. Participation was 100% at one clinic and close to 83% at two others. This response rate -- in the face of significant time constraints -- reflects the importance these providers place on addressing the issue of anemia in the community.
- c. Source of Federal Funds - Hatch/Smith-Lever 3 b and c
- d. Scope of Impact - Integrated research and extension/CT

### Key Theme - Human Nutrition

- a. Activity - Research was conducted to examine the molecular actions of thyroid hormone, with particular regards to its effects on fat synthesis and its interactions with zinc. Thyroid hormone is a key regulator of metabolic and developmental pathways. Zinc status also affects these processes, perhaps by regulating thyroid hormone action.
- b. Impact - We cloned and sequenced an important regulatory region of the acetyl-coA carboxylase gene, a key enzyme for fat synthesis. We also further characterized the novel and surprising negative effect of zinc on thyroid hormone action in cultured cells. We demonstrated that zinc deficiency does not appear to have a major impact on thyroid hormone action in the rat.



- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Human Nutrition

- a. Activity - Research was conducted to better understand the mode of action of soluble fiber and how it may reverse hyperlipidemia. A human study in the Department of Nutritional Sciences was conducted to evaluate the effects of gender/dietary fiber on lipoprotein metabolism. The potential differences in response between men and women and between pre and postmenopausal women will permit to make more accurate dietary recommendations to hyperlipidemic individuals who are at risk for coronary heart disease.
- a. Impact - Outcomes of research resulted in two presentations to Monsanto Company in Saint Louis, two presentations to CIAD, Hermosillo Sonora Mexico and a presentation for nurses, physicians and health practitioners at the General Hospital in Hermosillo, Sonora. A book chapter on "Pectin, Chemical, Metabolic and Physiological Properties" to be published by Marcel Dekker Inc. and a book chapter on Dietary Fiber for Current Opinions of Lipidology were prepared.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Human Nutrition

- a. Activity - Nutrition and feeding issues are significant for a large number of children with special health care needs such as underweight, overweight, nutrient deficiencies, and drug/nutrient interactions. To address this need, an interagency task force developed a manual to provide nutrition and feeding information for providers working with children with special health care needs. A grant from the Department of Mental Retardation supported development of training for providers and parents statewide on nutrition and feeding issues for this group of children. A manual "Nutrition Intervention Guidance for Service Providers and Families" was developed. Training sessions reached 90 providers (Occupational therapists, Speech pathologists, Developmental therapists, Physical therapists, Nurses, and Directors), 12 parents of children enrolled in Birth to Three and the manual was distributed to 39 Birth to Three Programs statewide.
- b. Impact - Providers were able to identify and make referrals to appropriate pediatric nutrition and feeding professionals who could provide assessment and counseling for families. Providers gained knowledge regarding the significant nutrition and feeding concerns for children with special health care needs. Providers gained skill in utilizing a nutrition screening tool developed for use by CT Birth to Three.

- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Human Health

- a. Activity - During September 1999 researchers were alerted to the possibility that a die-off of crows in southern New York and Connecticut might be related to human cases of encephalitis in New York City, at the time thought to be St. Louis encephalitis. Over 300 dead crows, received through a pre-existing liaison with the Department of Environmental Protection, were accessioned, triaged and necropsied. Of 83 crow brain sections submitted to the Connecticut Agricultural Experiment Station (New Haven) 72 specimens contained the virus.
- b. Impact - Demonstrated the presence of West Nile virus in 18 towns within Fairfield and New Haven Counties. The presence of positive birds identified towns at risk for the human disease and provided a guide for DEP and Public Health officials in introducing limited mosquito control spraying. No human cases occurred in Connecticut. The Department, College and University received widespread recognition for the role that our scientists played. In collaboration with investigators in New Haven documentation of the first recovery of West Nile virus in North America was published (Science 1999: 286: 2331-2333).
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Human Health

- a. Activity - The 4-H Double Dutch Youth curriculum served as the focus of promotion of Healthy People 2010, a program that endorses support of health promoting policies in schools, work sites and other settings. The program is designed to use traditional and innovative approaches to help Americans achieve the targeted goal of increasing the quality and years of healthy life and eliminating health disparities. African Americans, Hispanic Americans, women and adolescents from poor households are proportionally higher at risk for obesity than Caucasians, men and adolescents from middle to higher income households. A healthy lifestyle was promoted through eating a variety of nutrient dense foods and through the promotion of regular exercise and physical activity for youth enrolled in EFNEP and/or 4-H Programs. Extension faculty conducted professional presentations, applied for recognition awards and submitted grants for healthy lifestyles. The EFNEP liaison provided hands on food demonstrations and educational sessions with youth agencies and youth supporting organizations in addition to assisting with the training component of Summer Nutrition Training Program. Four hundred and thirty-nine low income, limited resource youth in New Haven were reached through various

agency partnerships. Fourteen youth workers and four adult supervisors were trained and participated in the Summer Nutrition Education Program. Three hundred and forty-three youth were reached through Hill Cooperative Youth Services with the Summer Nutrition Education Program, New Haven.

- b. Impact - Forty-two youth through Hill Cooperative Youth Services are using the 4-H Double Dutch Healthy Lifestyles Project Booklet. Pre and post questionnaires of sixty youth and their parents who participated in a workshop about healthy eating and exercise revealed an increase in knowledge of nutrition (range of 7 to 64% increase in knowledge and an average of 33% increase) for summer nutrition youth workers. After training in sanitation and food safety, youth were sensitized to food safety issues in other work settings as evidenced by youth's comments during a workshop conducted at the 4-H Resource Farm.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Human Health

- a. Activity - Citizens living in the vicinity of the Connecticut Yankee Nuclear energy plant increasingly expressed concerns related to the reported and possible other emissions of radiogenic elements into the atmosphere, the Connecticut River, and Long Island Sound. Much of the information on which these concerns were/are based, however, contained no scientific data and had little or no statistical significance. A study group was created to examine the relationship between atmospheric radiation emissions from the Connecticut Yankee Nuclear Plant and cancer incidences. Spatial distributions of cancer incidences and the distributions of potential doses from CYN were compared, with no correlation found between them.
- b. Impact - The study is now complete and the final report was prepared for presentation to the legislature. The legislature has been informed that there is no detectable effect of CYN on cancer incidences using the available data.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Human Health

- a. Activity - Lead poisoning is a serious but preventable health problem. Lead can cause permanent damage to children - especially unborn children, infants, toddlers and children under six years old. Children under the age of six, living in housing built before 1978, are at most risk for lead poisoning. Three separate programs were conducted and grant

funded to address lead poisoning prevention in children. The first program was developed to conduct staff training in at-risk childcare programs. The training for at-risk centers was been presented to one hundred ten (110) childcare providers from thirty-five (35) sites. These providers represent approximately 4,820 children in the city of Hartford.

The second program was The Little Moccasins training for tribal childcare providers and families, and the third program was conducted for the Maine Department of Environmental Protection to train the state's Childcare Resource and Referral Personnel. Emphasis was placed on training childcare providers because they are not only educators of young children but also sources of information for their parents and guardians. Childcare providers are also required by law to provide safe environments free of hazards.

A draft manual entitled Lead-Safe Renovation was written for use in training renovators, remodelers, painters, and maintenance personnel on lead-safe work practices. "Adventures of the Lead Busters Club" a 16-page activity book for second-graders completed in May, is part of a complete classroom-teaching packet on lead poisoning prevention for children. In partnership with the Hartford Health Department and Guida's Dairy a lead poisoning prevention message was placed on one million milk cartons during the month of May (Lead Poisoning Prevention Month).

- b. Impact - The Little Moccasins Training utilized original material and EPA region one's adaptation of the original CES childcare provider training manual. Funding for this training was received from The Narragansett Indian tribe of Charlestown, RI. The training was held in West Greenwich, Rhode Island, and included members of four tribal nations from Rhode Island, Maine and Massachusetts. A total of 22 participants attended two days of class for a total of 16 hours of training.

The training for the Childcare Resource and Referral Personnel for the Maine Department of Environmental Protection trained 10 professionals in two locations in Maine. These Referral Personnel are responsible for conducting training for all licensed childcare staff in Maine.

- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - Multi-state Extension/Maine and Rhode Island

#### Key Theme - Human Health

- a. Activity - One of the fats that is available in the diet is docosahexaenoic acid, more commonly referred to as DHA. This fat is important to fetal and perinatal development because it is laid down in high concentrations in the central nervous system during pregnancy and in the first two years of life. It is available in the natural diet in cold water marine fish, such as salmon, herring and tuna. Researchers hypothesized that women

during pregnancy have an increased requirement for this fat. The benefit for the infant of increasing consumption of DHA could be improved neurobehavior. Data have revealed that infants born to women with gestational diabetes mellitus (GDM), a diabetes that occurs during pregnancy in up to about 10% of all pregnancies, are at risk for DHA deficiency. Researchers demonstrated that DHA derived from the diet is related to neurobehavior as assessed by differences in sleep patterns of newborns. Thus, it is prudent to recommend that pregnant women consume more of the foods that provide DHA.

- b. Impact - It is important that the neonate be given every advantage when it comes to behavioral outcome. Advantages of recommending and ensuring the 'optimal' amount of DHA during pregnancy potentially include children who are more attentive and better learners. For the infant born to the woman with GDM, it may mean less risk for the neurobehavioral disorders associated with this pathology. Thus, positive impact may be felt on both social and economic factors. Federal money spent in the search for the 'optimal' level of DHA and the consequences of DHA deficiency will be repaid many times over, possibly in children with longer and better attention spans, without neurobehavioral disorders and with higher IQs.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

## Connecticut Annual Report of Accomplishments FY2000

### 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 pesticide and nutrient usage in significant ways, including 11 farms in the critically located Quinnipiac River watershed that drains directly into Long Island Sound - a national estuary of concern.

Research on the effectiveness of various agricultural and urban best management practices (BMPs) for water quality protection resulted in adjustments to state and federal guidelines in this area.

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 weekend retreat designed to address the critical issue of natural resource conservation and land use planning. Conducted through a partnership with a national heritage corridor - the Quinnebaug-Shetucket National Heritage Corridor - 30 new lay leaders gave high ratings to the program and made commitments to enact various appropriate public policies at the local and regional level.

Research led to the development of habitat suitability criteria (HSC) for adult brown trout in southern New England rivers. The research results will provide more accurate assessments of instream flow needs for brown trout conservation. Coyote research by College faculty on Cape Cod, Massachusetts, led to increased knowledge about coyote populations, which will assist managers in population management issues.

A highlight in this goal area was Extension activities to address 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 17 states across the United States. NEMO efforts in Connecticut resulted in programs delivered to representatives from virtually all Connecticut towns, with 19 communities revising their

comprehensive plans and/or taking other important public policy actions to better protect water resources.

Another highlight in this goal area was the development of a weed IPM program designed to enable farmers to accurately apply herbicides prior to the cropping year. A soil test procedure was developed and tested in trials on vegetable cropland. Possible savings of 40% in herbicide use per acre were realized.

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, our 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	596,857	10.374
Hatch	86,418	1.580
Multi-state research	7,376	0.170
State funds	2,250,784	36.688
Competitive grants	159,684	3.990
McIntire-Stennis	20,341	0.200
Total	3,121,460	53.002

\*These figures do not include an average 32% fringe rate.

## Connecticut Annual Report of Accomplishments FY2000

### Goal 4 - Greater Harmony Between Agriculture and the Environment

#### Key Theme - Water Quality

- 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, EPA's Smart Growth and Water Strategies, and Administration's Clean Water Action Plan 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. 12 out-of-state workshops were conducted, and the NEMO Project hosted 3 teams from other states at the Middlesex County office. 4 presentations were given at national conferences. Eight briefings of national agency staff were conducted. 2 new publications were produced. Extensive additions to the National NEMO web site were made.
- b. Impact - NEMO adaptations are underway in 17 states and being planned in many more. Funded programs include: Alaska, Ohio, Indiana, Idaho, Oregon, Maryland, Kansas, New York, Georgia, Alabama, South Carolina, North Carolina, New Jersey, Massachusetts (3 projects), New Hampshire and Maine. Planned projects include: Washington, Utah, Missouri, Louisiana, Texas, California, Delaware and Florida. The NEMO educational model is referenced in both the Administration's Clean Water Action Plan, and its Liveable Communities Initiative. The National NEMO Network Interagency Work Group has composed and posted (on the Web) a Charter documenting their support for the work of the Network.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - Multi-state extension/17 states (see b above)

#### Key Theme - Water Quality

- 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. NEMO has developed a wide range of educational programs and materials to assist local decision-makers. Over 150 educational workshops for local officials were conducted by request, on a variety of



topics. 10 regional workshops were conducted as part of a state-supported effort. Electronic watershed and land cover maps of all 169 CT municipalities were posted in the NEMO web site for the use of local officials and others. Original research was conducted in four CT towns, on the components of the landscape contributing to nonpoint source pollution. 6 new Extension publications and 4 project reports were produced.

- b. Impact - 5 Connecticut towns are revising their Comprehensive Plans and/or zoning regulations to better protect water resources. Two towns are conducting detailed watershed management plans. Eight towns are conducting natural resource inventories and/or open space plans. Four towns have revised their subdivision regulations to promote more environmentally friendly residential design and construction. Hundreds of acres of open space have been put into permanent conservation. NEMO was designated by EPA Region One as the official Connecticut contact organization for sprawl issues, and received an Environmental Merit Award from EPA.
- c. Source of Federal Funds - Smith Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Water Quality

- a. Activity - Publications were developed to assist in addressing hydrologic issues associated with land use development in Connecticut. "A Primer on Runoff in Connecticut," intended for the general public provided terminology related to the hydrologic cycle in general and to runoff in particular. "Guidelines for the Review of Hydrologic Impacts of Development Projects" assisted local officials in the review of hydrologic analysis for runoff prediction associated with development projects. "Review and Guidelines for Determination of Critical Duration" provided guidelines for practitioners in the field, e.g. engineers or hydrologist, to the determination of critical durations based on the type of land use, size of watershed and basin characteristics.
- b. Impact - The publications help the general public become better informed about hydrology; officials are more capable to review proposed projects and make better decisions regarding land use changes; and hydrologic consultants are better prepared in performing hydrologic analyses.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Water Quality

- a. Activity - Researchers studied the effectiveness of agricultural and urban best management practices. 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. The effectiveness of management practices to reduce non-point source pollution is largely unknown.

- b. Impact - Water quality was monitored and analyzed and the research results have changed the recommendations by state and Federal agencies on stormwater treatment devices and construction BMPs.
- c. Source of Federal Funds - State funds/Grants
- d. Scope of Impact - State specific/CT

#### Key Theme - Water Quality

- a. Activity - Connecticut is concerned with the continued deterioration of water quality within the Quinnipiac River watershed. Pesticides and fertilizers from the farm and non-farm industry represent potential pollutants that may influence water quality within the area as well as in Long Island Sound. IPM educational programs for 13 vegetable producers and other crops were organized to demonstrate alternative management practices, use of older pesticides with low-risk modern products, and introduce managers to new techniques to reduce nutrient and chemical use.
- b. Impact - 11 farms reduced their pesticide use on 366 acres of vegetables by 70% or 44,200 pounds of active ingredient (AI). Total use of the 12 pesticides with high or moderate leaching potentials was reduced by 79% or 36,176 pounds of AI. Fertilizer recommendations were altered on 79 acres and over 4 tons of nitrogen, 10 tons phosphorus and 10 tons of potassium were eliminated from use.
- c. Source of Federal Funds - Smith-Lever 3 b and c/Grants
- d. Scope of Impact - State specific/CT

#### Key Theme - Water Quality

- b. Activity - Nonpoint source pollution is the primary cause of water quality problems in Connecticut and the U.S. Urban runoff contributes to impairment of 5% of river miles, 8% of lake acres, 18% of estuaries, and 7% of wetlands. In Branford, the Branford Water Quality Stewardship Project focused on residential BMPs which reduce runoff and pollutants in runoff, particularly nitrogen and bacteria. The target audiences were identified through collaborative efforts with local organizations that provided guidance, recruited and managed volunteers at the local level and assist in training. Educated 11 active local volunteers and conducted active on-going monitoring of water quality. In

Norwalk, the Norwalk Watershed project saw 14 people receive training in the Norwalk River Watershed (including 4 Master Gardeners) focusing on residential nonpoint source pollution and best management practices.

- b. Impact - In Branford, eight local volunteers visited 24 residential properties in the paired teaching neighborhoods and conducted site assessments and collected soil samples for testing. Eighteen properties were revisited with soil test and BMP recommendations. Thirty-five water quality samples collected during storm events by volunteers were analyzed for nitrogen and bacteria leading to better understanding of issues facing the targeted neighborhoods. A poster of the Branford project was presented in Washington, DC, for Ag-Earth Day Partnership.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Integrated Pest Management

- c. Activity - Researchers released *Typhlodromus pyri* into northeast apple orchards for control of European red mites. *Typhlodromus pyri* is a biological control agent of the European red mite (ERM), a major pest in apple trees. Five Connecticut orchards participated in this project.

Researchers conducted a two-year project to investigate soil-dwelling pests in strawberries. The life of perennial strawberry plantings is determined by the severity of pest problems that build up as plantings age. A mail survey was conducted to determine baseline information from growers related to pesticide use and other production factors. In addition, 41 strawberry fields were sampled for black vine weevil and lesion nematodes. Research plots were also established to determine the effects of beneficial nematodes on these two pests.

- d. Impact - For apples, ERM were below treatment threshold levels in all release sites and in four of the five control plots (where predator mites not released). Also, *T. pyri* had moved into all control plots by 1999. *Typhlodromus pyri* has been shown to be a very effective biological control of ERM in Connecticut and other northeastern states. Results have been reported to growers in several presentations.

For strawberries, results show that insect pathogenic nematodes provide a biological control alternative for black vine weevils. Results have been reported to growers and will be incorporated into future extension publications.

- c. Source of Federal Funds - Grant funds
- d. Scope of Impact - State specific/CT

### Key Theme - Integrated Pest Management

- a. Activity - There is a growing need to develop and implement integrated pest management (IPM) systems that depend on biologically based tactics. More than 500 insect pests, 270 weed species and 150 plant diseases have become resistant to one or more pesticides. Concerns for human and environmental health and the cost of pesticide regulation stress the need for the switch to biointensive pest management systems. Researcher sought to understand tritrophic level interactions involving biological control agents. The objective of the research was to ascertain the effects of plant morphological complexity on two insect predators commonly used in biological control efforts.
- b. Impact - The impact from this work will not be immediate. In the long term, this research should contribute to our understanding of how plant traits influence biological control agents. For instance, release rates of a given natural enemy could be adjusted to overcome difficulties posed by certain plant qualities such as increases in leaf area or plant size throughout the growing season. On the other hand, certain plant morphological traits could be modified to enhance the pest control activity of beneficial insects.
- c. Source of Federal Funds - Grant funds
- d. Scope of Impact - State specific/CT

### Key Theme - Integrated Pest Management

- a. Activity - Peaches are grown in southern New England mostly for direct sales and in Connecticut there are an estimated 111 peach growers. Among the pest problems faced by growers are the “catfacing” insects. Research and extension effort developed monitoring guidelines, informed growers about which insect species are mostly responsible for observed fruit damage, and developed economic injury levels. This information will allow growers to use insecticides only when it is economically justified.
- b. Impact - Early stages of data analysis indicated that TPB is the major plant bug pest in the orchard and that trap color and location on the tree influences the total trap captures for certain dates. During the season of the study four applications of Guthion targeted against plant bugs were spared from the 30 acres planted to peaches. This represented a savings of 90 pounds of active ingredient resulting in a 44% reduction in insecticide use.
- c. Source of Federal Funds - Grant funds
- d. Scope of Impact - State specific/CT

### Key Theme - Integrated Pest Management

- a. Activity - *Serangium parcesetosum* is a coccinellid predator that has demonstrated potential for the biological control of silverleaf whitefly (SLWF), *Bemisia argentifolii*. A research study was initiated to determine whether *Serangium* has the ability to control infestations of silverleaf whitefly on greenhouse poinsettias below economically damaging levels.
- b. Impact - The successful use of an integrated whitefly management strategy that included the use of two different biological control agents, followed by application of a pesticide was demonstrated in this study. The use of biological controls in the study reduced the number of pesticide applications needed by one of the growers from four applications in the grower control house to one application in the biological control house. This information was used in the transfer of technology from the USDA to Hydro-Gardens, Inc. to mass produce the biological control agents.
- c. Source of Federal Funds - Grant funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Integrated Pest Management

- a. Activity - Ten apple growers with 470 acres participated in IPM programs. The objective of the training was to provide growers with IPM methodology and to encourage growers to try newer IPM techniques. All sessions included information on IPM methodology including pest identification, biology, monitoring, chemical and non-chemical management, pesticide issues, etc.
- b. Impact - Growers involved were able to reduce the number of pesticide treatments used by an average of 8.8 fewer treatments/apple grower. Pesticide use was reduced by 14,424 pounds of formulation on a total of 470 acres. Pesticide active ingredient was reduced by 7,146 pounds. This represented a savings on pesticide costs of \$104,598.
- c. Source of Federal Funds - Grant funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Integrated Pest Management

- a. Activity - Large numbers of growers trained in IPM needed annual follow up and updating as methods changed. An IPM website was developed to enable growers and the public-at-large to readily access important IPM information to use in making management decisions.

- b. Impact - The website was highly effective in delivering information to growers and the public, as it was accessed by over 80,000 people including 5,875 commercial growers, 388 schools and more than 73,000 of the general public.
- c. Source of Federal Funds - Hatch/Smith-Lever 3 b and c
- d. Scope of Impact - Integrated research and extension/CT

#### Key Theme - Integrated Pest Management

- a. Activity - In Connecticut, the greenhouse industry is a significant and growing segment of the agricultural industry. In the enclosed greenhouse environment, pest populations can develop rapidly so there is a need for timely up-to-date information to make pest management decisions. Three growers participated in full season IPM training programs. Field training focused on monitoring for key insects and diseases on a weekly basis from August to December.
- b. Impact - All growers stated that they would recommend the program to other growers. All participants increased their adoption of IPM practices. On average, the knowledge base increased by 15% among the three participants. For the participating growers, the number of pesticide applications was reduced a total of 5 sprays with 0.904 pounds of pesticide active ingredient withheld from application to 18,500 square feet of greenhouse production. All three growers rated their crop quality as very good to excellent.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Integrated Pest Management

- a. Activity - Provided weekly IPM training for commercial vegetable producers, worked regionally through a regional growers' conference, a Vegetable Management Guide, other publications, individual consultations, farm visits, newsletters, articles for an IPM web site, and a weekly recorded telephone/internet message (699 hits/calls on pest message and over 78,000 on IPM web page).
- b. Impact - Growers reduced the number of pesticide applications on 518 acres of sweet corn and peppers by 38% and the amount of active ingredient they used by 1,532 pounds (3 lbs./acre or 37%), and increased their crop yields by 3-7% and saved \$46,965 (\$91/acre). This helps Connecticut maintain a cleaner environment, a source of safe food production and the open space that farmland provides.

- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - Multi-state extension/New England states

Key Theme - Integrated Pest Management

- a. Activity - There was a need to develop weed IPM programs in order to meet the 75% of cropland under IPM management target. Weed IPM programs have not enjoyed the success of insect and disease programs because much of the weed control effort consists of preemergence herbicides applied before or at planting when no weeds are present. Because weed infestations cannot be assessed, herbicides are applied in combinations intended to control any mixture of weeds that might occur. This practice results in unnecessary and excessive use of herbicides. Researchers developed a soil test procedure that includes extracting weed seeds and measuring soil physical and chemical properties. Weed populations can be predicated based on this information. Weed emergence prediction experiments were conducted to determine the suitability of using a nonlinear poikilotherm rate equation to describe the relationship between germination and temperature, and a Weibull function to fit the cumulative seed germination for three annual weed species.
- b. Impact - Grower trials conducted on 50 acres of commercial vegetable cropland showed herbicide savings were possible on 40% of the acreage. An average of 1.2 lb ai/A of herbicide was not applied per acre.
- c. Source of Federal Funds - Hatch/Smith-Lever 3 b and c
- d. Scope of Impact - Integrated research and extension/CT

Key Theme - Integrated Pest Management

- a. Activity - Pesticide use on peppers at many conventional farms is extremely high (> 13 lbs./acre). Many of the most commonly used pesticides are not very effective on the target pests, have high or moderate leaching potentials, are highly toxic and are hard on beneficial organisms. Broad-spectrum pesticide applications often result in secondary pest outbreaks, which necessitate the use of more chemicals to save the crop. A research and extension program was designed to help develop, combine and disseminate information on less disruptive forms of pest control for peppers. Researchers throughout the Northeast conducted experiments on all the major, and a few minor pepper pests in the region including; weeds, bacterial leaf spot, Phytophthora blight, European corn borer, pepper maggot, corn earworm and fall armyworm.
- b. Impact - Results from this research/extension effort were presented at a variety of seminars at regional and state conferences that were attended by over 600 growers and Extension workers. The project P.I.'s also served as the editors for a Northeast Pepper

IPM Manual. This 25-chapter book has contributions from 17 Extension Specialists from the region and combines recent research findings on all major and minor pests with over 200 color photographs. A large Connecticut producer (700 to 800 acres vegetables, up to 39 acre of peppers) utilized IPM techniques on his crops and had the best pest control and highest net profits ever (<1% crop loss from all pests combined), and short day-to-harvest label restrictions simplified harvesting operations. Eliminating the use of all broad-spectrum pesticides will help assure an abundance of natural enemies and minimize the chance of secondary pest outbreaks in his future pepper plantings.

- c. Source of Federal Funds - Hatch/Smith-Lever 3 b and c
- d. Scope of Impact - Multi-state integrated research and extension/Northeast U.S. states

#### Key Theme - Integrated Pest Management

- a. Activity - A research-based Extension program addressed weed management alternatives for farmers growing field corn. Field corn production is an important part of the dairy industry in New England. With sales of over \$700 million, milk continues to be the top contributor to the overall agricultural market in New England. Connecticut's 29,000 dairy cows ranked 11th in the country in milk production per cow. High quality forage is an important ingredient in achieving this level of production. Farmers were educated at several on-farm research and demonstration trial sites in order to show the results of alternative strategies for weed management in field corn.
- b. Impact - Negative impacts of weed problems associated with field corn were reduced. Field corn yield and quality was increased. Growers reduced both the rate and number of applications of field corn herbicides. Growers reduced or prevented water degradation from pesticides either through elimination or through rate reduction of preemergence herbicides with severe potential for soil leaching. Atrazine and metolachlor, two of the most commonly used field corn herbicides, whose use poses the greatest potential pesticide threat to groundwater among the corn herbicides currently applied, was reduced.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Integrated Pest Management

- a. Activity - Turf IPM training was provided to commercial individuals and companies, government agencies and residential homeowners. Faculty worked with the turfgrass industry to disseminate applied research results through educational Extension or college credit courses, twilight meetings, state and regional conferences, and other events. There



were approximately 40 acres of turfgrass managed under IPM and presentations were offered to 297.

- b. Impact - A total of 221 pounds of pesticide active ingredient (AI) (426 lbs. AI pre-IPM; 647 lbs. AI post-IPM) was saved from application. This represents a 34% reduction in the pounds of AI saved from application to turfgrass in Connecticut. The greatest savings in pesticides came from spot treatment or “as needed” applications of broadleaf herbicides instead of broadcast applications. In addition to pesticide reductions, potential fertilizer use was reduced. There were 3 pounds of nitrogen applied per 1,000 square feet versus a potential for fertilizer use of 4 pounds of nitrogen per 1,000 square feet. A total of 1,742 pounds of nitrogen (6,968 pre-IPM; 5,226 post-IPM) was saved from application to turfgrass, a 25% reduction in nitrogen use.
- c. Source of Federal Funds - Grant funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Agricultural Waste Management

- a. Activity - Concerns with contributions of nonpoint source water pollution from animal waste operations has enhanced recognition of the need to keep nutrients on the farm. Nutrient Management Plans were developed for 10 dairy farms, which generate 13,148,760 gallons of liquid manure annually. GIS technology was used to map farm fields thereby enabling farmers to visualize their entire operations at one glance. With the maps everyone can refer to a field using the map code and anyone will immediately know what field is being referred to. This project has been made possible by a collaboration of EPA, CT DEP, USDA NRCS and UConn CES.
- b. Impact - Farmers have taken to hanging the GIS generated maps of their farms in prominent places in their barns to show visitors, as well as to use them as management tools to show workers exactly which fields are to be worked that day, thereby enhancing the likelihood that the plans will be easily implemented.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Nutrient Management

- 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. In certain instances, turf receives comparable or greater amounts of fertilizers and pesticides than cropland. This has raised concerns for water quality in turf areas that receive fertilizers and pesticides. A research program evaluated

the effects of different fertilizer sources, timing of fertilizer application, fertilizer rates, clipping management, and irrigation amounts on the leaching losses of nitrogen from turf used for various purposes.

- b. Impact - Research results suggest that nitrogen fertilizer inputs can be reduced by 50% or more when clippings are returned to the turf without a loss in turf growth and quality. Results further showed that scheduled irrigation plus natural precipitation greatly increases the leaching losses of nitrogen from turf, soluble formulations of nitrogen fertilizer are more likely to leach than slow-release formulations or organic sources, and returning clippings without a reduction in nitrogen fertilization rates increases the potential for leaching losses from turf.
- c. Source of Federal Funds - State funds/grant funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Sustainable Agriculture

- a. Activity - Commercial greenhouse growers face a number of issues that impact environmental quality and sustainability. Research efforts were focused on the development of recommendations to improve crop pests management and crop productivity, and to create new production opportunities. 55 growers attended poinsettia cultivar trials or the University of Connecticut, 425 growers attended the 2000 Perennial Plant Conference in Storrs, CT, 600 Connecticut growers received the semi-monthly Yankee Grower: The University of Connecticut Journal for Profitable Horticulture. The Journal included 24 articles on crop and crop nutrient management, 27 articles on aspects of pest management and pesticide safety, 7 articles on economic, sales, or labor management and 1 article related to greenhouse engineering.
- b. Impact - Greenhouse growers demonstrated a strong response to ongoing educational programs as evidenced by 873 Connecticut growers received recommendations on aspects of pest management, or crop nutrient or cultural management via phone, fax or e-mail inquiries. 117 Connecticut growers received direct diagnostic advice via grower visits and walk-in consultations. 57 Connecticut high school vocational agriculture students participated in the Annual Floriculture Plant Identification Contest.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - Multi-state extension/New England states

#### Key Theme - Natural Resources Management

- b. Activity - Invasions of non-native plant species into residential properties, public lands or other natural areas may cause a significant decline in biological diversity and reduce the

quality of these important habitats. Invasive non-native plants are one of the most serious threats to native species and the environments that they are found in. The U.S. loses over 4,600 acres of wildlife habitat per day to invasive non-native plants, and environmental damage by both invasive plants and animals is estimated at \$122 billion per year. The Connecticut Invasive Plant Working Group launched a new web site at <http://www.eeb.uconn.edu/invasives> to provide public access to information concerning invasive plants. The Working Group is a consortium of individuals, organizations and agencies concerned with invasive plant issues.

Programs were disseminated through 16 presentations and field demonstrations, two new invasive plant posters, four new fact sheets and other publications, a new web site, electronic mail and personal communications. More than 61,840 people received information from presentations, poster exhibits, workshops, and educational materials developed. An additional 479,000 people gained knowledge about invasive plants from newspaper articles.

- b. Impact - There is an increasing demand for information on invasive plant species by the general public, by educators and by managers of minimally managed habitats. The knowledge gained by these individuals is being used to identify invasive species and make informed decisions about options for management and use of non-invasive alternative plants. Through these efforts native species occurrence and diversity will be restored and the quality of important ecological habitats preserved.
- c. Source of Federal Funds - Grant funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Natural Resources Management

- a. Activity - Many former rail lines are being converted to trails. The conversion of rails to trails is happening across the United States and the Rails to Trails Conservancy (RTC) states that there are over 1,000 completed rails-trails and additional 1,200 projects underway. The rails to trails movement have created 10,000 miles of public trails. The RTC estimates that in 1999 these trails were used more than 100 million times. Trails can have a tremendous economic benefit, to the communities along the trails. Researchers and students developed a Guideline document, which will be used as an official DEP Rail-to-Trail publication.
- b. Impact - The statewide guidelines for rails to trails will now be available for use by public decision-makers, better enabling these assets to be wisely used for future generations.
- c. Source of Federal Funds - State funds
- d. Scope of Impact - State specific/CT

## Key Theme - Wetlands Restoration and Protection

- a. Activity - Purple loosestrife is an invasive non-native plant from Europe that moves aggressively into wetlands, displacing native plant species and reducing the quality of these important habitats for wildlife. Biological control is recommended as a sustainable, cost-effective, long-term method for purple loosestrife management. Four species of biological control agents were approved by the USDA in 1992 for control of purple loosestrife. Connecticut has participated in efforts to reduce purple loosestrife infestations since 1996. Formal presentations and field demonstrations/training sessions, along with magazine and newspaper articles and educational information appeared on two web sites for purple loosestrife (part of the IPM web site) and invasive plants (new web site developed).
- b. Impact - Purple loosestrife biological control agents are becoming established in Connecticut and are beginning to cause localized purple loosestrife defoliation at some of the study sites. More than 40,000 people received information from presentations, poster exhibits, workshops, educational materials developed and media releases. An additional 93,755 people gained knowledge about invasive plants from newspaper articles. Program efforts in Connecticut continue to expand each year and the program has been well received statewide. The growing interest in invasive plants, including purple loosestrife, has resulted in a large increase in requests for information and presentations relating to this program. Concerns with pesticide applications for control of invasives have led to requests by the general public for alternate management methods, including biological control.
- c. Source of Federal Funds - Grant funds
- d. Scope of Impact - State specific/CT

## Key Theme - Pesticide Application

- a. Activity - A 5-year, EPA funded study on pesticide spray drift was completed. The study was a cooperative work between the University of Connecticut, New Mexico State University and the Connecticut Agriculture Experiment Station (New Haven). In the study numerical models of spray movement and deposition were developed. Experimentally, it was found that atmospheric stability is the critical environmental variable that must be taken into account by sprayers. Also, it was determined that crop canopy geometry can be manipulated to effect spray drift.
- b. Impact - Discussions are underway with the CT DEP about using our results to help plan their mosquito control program during encephalitis outbreaks and similar public health crises.

- c. Source of Federal Funds - Hatch
- d. Scope of Impact - Multi-state integrated research and extension/New Mexico

#### Key Theme - Pesticide Application

- a. Activity - The University of Connecticut Cooperative Extension System provides training for private pesticide applicators in the State of Connecticut enabling them to maintain their knowledge of safe use and handling of pesticides and pertinent pesticide regulations. Private applicator re-certification training programs were held in 7 of Connecticut's 8 Counties. Additionally, 9 specially prepared educational programs were presented for commodity groups and organizations. Approximately 625 individuals received pesticide safety training, of these approximately 400 private applicators received re-certification credits. Sixteen educational programs were offered.
- c. Impact - 97 individuals participated in Extension sponsored general re-certification training programs. Pre and post training evaluation of the knowledge of 78 of these participants indicated a 20% increase in the knowledge of how pesticides move off target into the environment and how to avoid or reduce pesticide drift. These same participants demonstrated a 28% increase in knowledge of the characteristics of pesticides and soils, which contribute to groundwater contamination, and a 45% increase in recognition and understanding of signal words indicating level of hazard on pesticide labels.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Forest Resource Management

- a. Activity - The forested land area of the state of Connecticut provides numerous benefits to the quality of life and economy of the state. Protecting public and private water supplies, supporting a 400+ 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. Private individuals and groups manage the bulk of this forested land (almost 90%). The Connecticut Forest Stewardship Program provides technical assistance and education to private forest landowners and forestry professionals, educating them as to the advantages of actively managing their forest holdings, and providing guidance for accomplishing certain management activities.
- b. Impact - Twenty-eight landowners with a combined acreage of just over 7500 acres completed Forest Stewardship Plans. Increased interest in the Forest Stewardship Program represents a potential 20% growth of the program over the next year. An estimated 80% of newly enrolled Stewardship landowners planned or conducted

management activities on their properties generating commercially valuable forest products.

- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Forest Resource Management

- a. Activity - The annual Tree Warden School educated 30 tree wardens in tree biology, tree care, hazard tree assessment, public participation, tree law, and meeting management during five half-day sessions.
- b. Impact - Tree Warden School participants rated the program 3.6 out of 4.0 in terms of knowledge gained, and a 3.8 in terms of the applicability of information to their duties. Application of knowledge gained enables Tree Wardens to make informed and responsible decisions about the care and preservation of public trees while protecting the public from hazardous tree situations. The program is serving as a model for the urban and community forestry program efforts in Maine and Vermont.
- c. Source of Federal Funds - Smith-Lever 3d (RREA)
- d. Scope of Impact - State specific/CT

#### Key Theme - Land Use

- a. Activity - Attitudes toward farmland preservation in Connecticut were ascertained through a statewide survey by the UConn Roper Center. Over 70% of state residents surveyed were in favor of farmland preservation. The survey enabled faculty to provide key empirical data (to state legislature, CT farm bureau, Working Lands Alliance, CT Food Policy Council, etc.) for consideration as the State legislature weighed a decision to fund \$6.4 million in farmland preservation bonds.
- b. Impact - All major newspapers in the state ran editorials about the issue, articles about this piece of research appeared in the Hartford Courant, New York Times, Hartford Advocate, and numerous local newspapers. The state legislature made a more informed decision about a public policy for agriculture. In this case the research provided the legislators with better knowledge of their own public's opinion on the issue.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

## Key Theme - Land Use

- a. Activity - Municipal land use officials hold a tremendous influence over present and future land uses in Connecticut. They have an ongoing need for up-to-date resource data and education on a wide variety of topics. The current availability of these resources is generally insufficient for optimum decision making. A high turnover rate exists in all these groups, creating an ongoing need for these resources. Municipal officials were educated in natural resource conservation and land use planning at an innovative new weekend retreat. Designed to become an annual event, this “Natural Resources 100” program is designed to provide 30 new lay volunteers each year with the basic background and resource contacts they need to do their volunteer jobs effectively. Partners include the QSHC, NRME Department, NRCS and the DEP. Participants included 2 municipal selectmen, several municipal Commission chairs and co-chairs and other commission members.
- b. Impact - On scales of 1 to 7, participants rated the overall program 6.5 in terms of knowledge gained, and 6.4 in the applicability of the knowledge to their natural resource volunteer jobs. They also requested a six-month reunion meeting to compare progress towards the goals set at the program’s planning session. CES and QSHC have partnered to implement a continuing education in natural resource conservation curriculum in the 35-town QSHC region. This effort began with a survey of municipal officials, local land trust leaders and other natural resource volunteers in the QSHC. The survey, which had a 35% response rate, showed that those polled were most interested in creative development techniques, open space planning, water supply planning, basic ecology and enhancing wildlife habitat.
- c. Source of Federal Funds - Smith-Lever 3 d (Water Quality)
- d. Scope of Impact - State specific/CT

## Key Theme - Land Use

- a. Activity - Residents of Northeastern Connecticut are very concerned about preserving their community character. Development pressure has been slow to reach this corner of the state but the ease of travel to Worcester, Hartford and Providence has brought with it the inevitable pressure of residential and commercial development. Communities have tools available to them to help to preserve their character - historic districts and village districts. These powerful tools are often not taken advantage of by municipalities because they do not fully understand how to implement and utilize them. Municipal officials and commission members were educated on the opportunities available to them to assist them in the preservation of community character through public presentation, presentation at commission meetings, and one on one discussion. Partners include the QSHC and the Northeastern Council of Governments. This is an on-going educational process that has reached approximately 50 municipal officials.

- b. Impact - Two towns established village districts and two others are strongly considering it.
- c. Source of Federal Funds - Grant funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Land Use

- a. Activity - Northeastern Connecticut is often referred to as the "Last Green Valley" between Boston and Washington, DC, because of its natural, historic and cultural resources. In recognition of the unique value of Northeastern Connecticut, Congress designated a 25 town, 850 square mile area as the Quinebaug and Shetucket Rivers Valley National Heritage Corridor (QSHC) in 1994. In 1999, the QSHC was expanded to include one additional Connecticut town and nine Massachusetts towns. Suburban sprawl, loss of farmland and the abandonment of historic mills are threatening the character of the area. The QSHC has established a Management Plan and an Action Plan which focus on land use, economic development, tourism, agriculture, outdoor recreation and historical, cultural and natural resources. Municipal officials and commission members were educated on the Management Plan and Action Plan of the QSHC through public presentation, presentation at commission meetings, one on one discussion, and a quarterly newsletter. This is an on-going educational process that has reached approximately 900 municipal officials, land trust leaders and other natural resource volunteers.
- b. Impact - Municipal officials are aware of the resources available to them through the QSHC including the Partnership Program, the Mill Reuse Initiative and the Corridor Circuit Rider. Seven towns have incorporated language in support of the QSHC in their Plans of Conservation and Development. One Council of Governments has incorporated language in support of the QSHC into its Plan of Conservation and Development.
- c. Source of Federal Funds - Grant funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Land Use

- a. Activity - Many urban waterways in the U.S. are segregated from neighborhoods, neglected, and have disrupted ecosystems. Researchers and students studied means and methods to restore, maintain, and enhance the ecological integrity and social viability of the South branch of the Park River in Hartford, CT. Three objectives were identified to achieve the goal: (1) restore health of the South Branch of the Park River watershed, (2) restore an active relationship between the residents of Hartford/west Hartford/Newington and the South Branch of the Park River, and (3) connect greenways, bikeways, etc. to the



system outside of the focus area. Researchers and students participated in a community design workshop and developed a Master Plan for the river.

- b. Impact - The developed Master Plan document represents the strategic plan that is being used to coordinate activities of numerous state and city agencies.
- c. Source of Federal Funds - State funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Land Use

- a. Activity - The Airline Trail North is a 35-mile long trail that passes through the Quinebaug-Shetucket River Valley, a mostly undeveloped area that is beginning to feel the pressures of incipient growth. The region is three-quarters farmland and forest. In 1994, the region was named a National Heritage Corridor. This new type of national park allies government with business, citizens, and non-profits organizations to preserve and enhance the character of a special region, while encouraging development that recognizes this. Researchers and students made recommendations for general elements to enhance safe access and environmental and historic attractions nearby in this unique area of Connecticut. A design guideline document will be used as a Q & S publication.
- b. Impact - The design guideline document will be used by five towns to guide trail development, thereby enabling towns to take a regional, cooperative approach to protecting and enhancing the natural environment in the region.
- c. Source of Federal Funds - State funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Wildlife Management

- a. Activity - Research focused on developing habitat suitability criteria (HSC) for adult brown trout in southern New England rivers. The HSC are important tools for modeling and assessing changes in the quantity of suitable habitat (depth, velocity, substrate, and cover) in response to changes in flow regimes. Habitat suitability criteria were developed for adult brown trout in the Farmington River. Until this study, no HSC were developed for brown trout in Connecticut. Fishery managers in Connecticut and the region can utilize these newly developed HSC to assess change in habitat that is impacted by flow variations caused by dams and other water diversions.
- b. Impact - Local fishery management agencies now have regionally developed HSC to apply to streams for trout habitat assessments. A test of transferability of HSC developed in other regions showed poor transferability, strengthening the need for regionally

developed or river-specific HSC. This research should provide more accurate assessments of instream flow needs for brown trout conservation in southern New England.

- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Wildlife Management

- a. Activity - There is a lack of knowledge about the home range, movements and social behavior of coyotes in Cape Code, MA. Knowing more about the way that these animals interact among themselves and with humans and how they use the space is important for the management of the species. Researchers worked with colleagues from Boston College and Barnstable County in Cape Cod to study movement and population numbers of coyotes on Cape Cod. Found that density of coyotes is not as high as originally thought for the county of Barnstable. The way that coyotes move makes people think that there are many more animals around.
- b. Impact - The density of coyotes is not as high as originally thought for the County of Barnstable. The way that coyotes move makes people think that there are many more animals around. State and local agencies and organizations have new knowledge that coyotes have a self-regulating population and some principles on how to manage the population.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

## Connecticut Annual Report of Accomplishments FY2000

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

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

Research that analyzed the proposed Royal Ahold/Pathmark merger evaluated the negative impact of horizontal mergers in the U.S. supermarket industry on consumers. This work contributed to Ahold's decision to subsequently drop its attempt to acquire Pathmark.

A study of ozone concentrations, the primary air pollutant that exceed EPA health standard in Connecticut, demonstrated that the Connecticut emission-testing program had no effect on ozone levels in the atmosphere. Recommendations from the report are being considered by the State legislature.

Extension education programs for non-commercial poultry flock owners saw a major increase in adults involved with poultry projects, as well as additional numbers of youth involved in the state 4-H poultry show. Economic impacts were seen with increased feed and equipment purchases across the state.

Extension efforts in leadership development through the People Empowering People program (PEP) were designed to work with adults and older youth with limited financial resources to enhance their ability to help themselves and their communities. 81% of the 35 adults and 10 teenagers who graduated from the program showed improved communications skills, and a like number showed increased knowledge of community resources, shared new skills and increased awareness of positive parenting practices.

Parenting education programs were designed to enhance healthy family functioning through positive parent-child interactions, communications and discipline techniques. Of the 85 parents who participated, all felt better about their parenting practices, with 81% improving their parenting skills.

Extension programs in family resource management were developed to focus on issues related to increased debt and personal bankruptcies. Educational programs reached numerous audiences, including single females, low-income individuals, and the elderly through 69 programs, three state conferences and use of numerous media outlets. Increased money management skills resulted, according to high levels of positive responses to program surveys.

A major consumer education effort for youth was implemented through the 2000 LIFESMARTS Competition for high school youth where demonstration of knowledge about consumer law, personal finance and health was required.

A program highlight in this goal area included the MONEY 2000 program, a new effort conducted in conjunction with the National USDA/CSREES Program, designed to promote

savings and reduce debt. Impacts of the programs saw 218 participants committed to saving over \$165,000 in new savings and debt reduction.

Another program highlight included a workforce preparation program for 4-H youth that offered youth entrepreneurship programs and work to 142 youth. The program integrated workforce participation into existing programs to foster the development of skills (SCANS) needed for entrance into the workforce in the year 2000. Youth demonstrated improved workforce readiness skills in business organization, money management and other relevant skills, with commensurate improvements in school attendance and team work skills.

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, our 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	776,576	15.264
Hatch	38,296	0.630
Multi-state research	7,376	0.170
State funds	1,311,747	22.120
Competitive grants	108,697	2.838
McIntire-Stennis	---	---
Total	2,242,692	41.022

\*These figures do not include an average 32% fringe rate.

## Connecticut Annual Report of Accomplishments FY2000

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

#### Key Theme - Community Development

- a. Activity - Ozone is the primary air pollutant, which consistently exceeds the EPA health standards in Connecticut. The CT State legislature asked the Connecticut Academy of Science and Engineering (CASE) to examine effectiveness of the CT Auto Emission Inspection Program that is supposed to reduce the Ozone problem. UConn analyzed the Connecticut atmospheric ozone measurements for the period 1981-1997. Results were contained in a report to the Legislature on the "Efficacy of the Connecticut Motor Vehicle Emissions Testing Program" (Connecticut Academy of Science and Engineering, 2000. 38p. No specific effects of the Connecticut emission-testing program could be detected in the ozone measurement record.
- b. Impact - Recommendations from the CASE report for changes to the auto emission inspection program are being considered by the state legislature.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Community Development

- a. Activity - Tax practitioners who attended an annual tax school were provided with new information and education about the upcoming tax season requirements. 226 tax professional attended the school. Each received 16 hours of CPE credits.
- b. Impact - The tax practitioners involved acquired improved skills that helped them to work with the many businesses and individuals who use their tax expertise. The overall result is improved tax management policies for households and businesses within the state.
- c. Source of Federal Funds - Hatch
- d. Scope of Impact - State specific/CT

#### Key Theme - Community Development

- a. Activity - Researchers analyzed the proposed Royal Ahold Pathmark merger and, more generally, the impact of horizontal mergers in the U.S. supermarket industry on consumers. Empirical analysis documented a positive relationship between seller concentration in local markets and prices for Stop & Shop and Giant supermarkets (Royal

Ahold chains). We estimated county level price increases in New York and New Jersey after the Royal Ahold Pathmark merger, if it was consummated. A second study of the impact of divestiture on consumer prices after the 1996 Royal Ahold acquisition of Stop & Shop indicated that divestiture in local markets in Connecticut failed to generate sustained price competition. After 12 to 15 months, prices rose as much as 10% to pre-merger levels in all of the markets studied. This research was presented to antitrust regulators reviewing the merger at the FTC, the New York and New Jersey attorneys' general offices.

- b. Impact - Ahold dropped its attempt to acquire Pathmark, a supermarket chain with 132 stores and \$3.7 billion in sales, citing in a press release, "a distinct departure from past policies, (by antitrust authorities). Ahold had been willing to divest a very considerable number of stores, but the regulators would not accept that concession." (Business Wire, 12/16/99). Our research played a critical role in this change.
- c. Source of Federal Funds - Hatch/Food Policy Center
- d. Scope of Impact - Multi-state research/Northeast U.S. states

#### Key Theme - Community Development

- a. Activity - Economic viability in Connecticut is generally dependent on success at one or more innovative frontiers. One approach is to stay on the frontier of technical progress, increase farm size, and produce more efficiently than competitors with lower input prices. Innovative marketing is another frontier and is less dependent on large-scale production. The primary advantages of close proximity to customers are increasingly in direct marketing with a recreational component. A growing number of farmers, along with other rural residents are interested in new and expanded recreational enterprises. Regional tourism districts and the Connecticut Departments of Agriculture and Economic and Community Development are promoting agricultural and natural resource-based tourism. Direct marketing and recreational activities are the most likely routes to economic viability for many Connecticut farmers. Pre-venture planning is needed to reduce the probability of ill-fated investment and to provide direction for the new enterprise. Information and training are especially important at the pre-venture and start-up phases of a farm business or enterprise.
- b. Impact -A case study, "Developing Agricultural and Nature-based Tourism in Eastern Connecticut" written with Nini Davis, was published in a textbook, Peter Schaeffer and Scott Loveridge, ed., Small Town and Rural Economic Development: A Case Study Approach. Westport, CT: Praeger Publishers, 2000. The textbook is intended for undergraduate students and professionals interested in community and rural economic development. The Eastern Connecticut case study describes a regional economic development and marketing project that used a collaborative approach to enhance agriculture and tourism's common contributions to rural economic development. Cooperative Extension worked with two tourism districts, CT Departments of Agriculture

and Economic and Community Development, CT Farm Bureau and USDA in developing and implementing the project that continues informally to bring farmers and tourism officials together to strengthen rural economic development.

- c. Source of Federal Funds - State funds
- d. Scope of Impact - State specific/CT

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

- a. Activity - The State Strengthening Grant in the Eastern Region of Connecticut was designed to provide positive youth development to three communities: New London, Groton, and Windham. Through the use of 4-H curricula, the goals of the program are to promote positive self-image in the children and to provide them with an opportunity to learn new skills that will afford them alternatives to lives of poverty, substance abuse, and poor familial relations. The 4-H LIFT program served 141 students.
- b. Impact - Participation in the Leadership Skills for Life: Eastern Connecticut Service Learning Project continues to grow. Students from Norwich, Groton, New London, and Windham were gathered together with the Teen Counselors from the New London County 4-H Camp for a day of cleaning and fellowship at the camp. Volunteers continue to provide guidance to the 4-H clubs. Parent involvement as chaperons and special event volunteers continues and more parents become involved with the programs through the years. Between 40-50 college students volunteered with the 4-H LIFT program.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

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

- a. Activity - There is a great increase in the number of poultry being reared for non-commercial use in New England. 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, etc. Our focus was to educate poultry owners about the proper management and rearing of their poultry.
- b. Impact - As a result of Youth and Non-Commercial Poultry Programs, there has been a marked increase in the number of people involved with poultry. An estimate is a 3-5% increase during the past 2 years. This resulted in 87 4-H youth involved in the 2000 State 4-H Poultry Show and Showmanship contest, a 16% increase over 1999 and a 63% increase over 1998. Due to the success of the poultry show another 10 4-H clubs in CT (6) and MA (4) have been started or shifted interest to poultry over the past two years.

As more youth become involved, more networking is occurring and more become interested. There was also a major increase in adults involved with poultry projects with about 50 new to poultry within the past year. 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.

- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

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

- 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 that do not flourish in traditional school settings find success and feelings of accomplishment in the more informal camp setting. 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. 125 teen counselors at the Hartford County 4-H Camp and 32 staff at the Windham-Tolland 4-H Camp learned new skills for understanding and appreciating diversity. Professionals in the camping industry have gained knowledge and skills through their interactions with the Extension Educator at professional meetings, workshops and informal contact. 3,736 youth attended a CT 4-H resident camp for at least a week last summer.
- b. Impact - an extensive survey of camper parents revealed that 97% of campers felt the campers' experiences were excellent or good. Several stated that camp made a positive impact on their child's life (i.e. gained confidence in meeting new people, able to better make decisions, improved self esteem, more self sufficient and responsible, shared cultural and ethnic identities, grew in maturity, experienced a sense of belonging and acceptance, increased patience and cooperation).
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Youth Development and 4-H

- a. Activity - Faculty and youth 4-H members participated in the new USDA training program, "Teens Teaching Internet Skills." Twenty-five teens, eight leaders and five faculty and staff participated in the 4-H Science booth at the Science Expo at Trinity College.



- b. Impact - Connecticut 4-H was one of only six states to be chosen for the initiation of a USDA and US Department of Health and Human Services project to teach senior citizens how to use the internet to access Medicare Information. Seven CT 4-H Computer Club members taught a six-hour course on Medicare and the Internet to eight senior citizens. Aspects of the Science and Technology area of CT 4-H program was presented by 4-H members this spring at the four-day Ninth Annual CPTV Family Science Expo. Over 1,000 children, youth, parents and teachers learned science principles through the non-formal physical, life, and earth science activities presented by 4-H clubs at this year's CPTV Family Science Expo.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Children, Youth and Families at Risk

- a. Activity - The People Empowering People (PEP) program provided leadership training and service learning to at-risk youth. Eleven participants in grades three through five have participated in this program. The children in the PEP program are a very diverse group and the main focus of PEP was to help the children to get along, to work together, to become community leaders and to serve the community. Participants include African Americans, Dominican, Cambodian, Vietnamese, BI-racial and Puerto Rican youth.
- b. Impact - The children in the program completed several service projects. Many of these youth had never had anything positive about them displayed on the wall of the school. Their teachers and school principals commented on their improved attitudes and achievement in school. They began to feel that they could make decisions and plan activities.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Child Care/Dependent Care

- a. Activity - Child Development Associate (CDA) certification exists in Connecticut for early childhood (infant, toddler, and preschool) professionals but does not exist for the school-age (5-12 years) child care professional. School-age childcare professionals would like the same professional recognition and status statewide and nationally.

Faculty from Cooperative Extension developed school age CDA training curriculum in collaboration with Connecticut School-Age ChildCare Alliance (CSACCA) and Connecticut Charts-A-Course. Nine participants completed twenty-four training hours, two participants completed twenty-one hours.

- b. Impact - Two participants who are site directors decided to initiate changes in their programs based on the information presented to increase the quality of their programs. All participants indicated they experienced an increase in their knowledge and skills from the training. All indicated they used their new knowledge and skills while working in their child care centers; consequently, they expressed experiencing initial stages of positive behavior changes in the children and staff. Eight participants indicated they presented and encouraged their supervisors to use the information presented in the eight core area overviews to improve the quality of their school-age child care programming.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Child Care/Dependent Care

- a. Activity - Having school-based child care programs that are parent owned and operated provides powerful, positive learning opportunities for local communities. Volunteer parents whom are members of a Board of Directors learn the many facets of operating a small child care business. Connecticut Cooperative Extension System coordinated training to such a program - the Eastern Point School-Age Child Care, Inc.
- b. Impact - The Eastern Point School-Age Child Care, Inc. program increased the quality of their programming. Their enrollment increased from twenty-three students to forty, representing approximately thirty-six families. The director received state licensing as the head teacher, which is a state requirement. Survey results indicated that overall the parents were pleased with their programs.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Leadership Training and Development

- a. Activity - CT has the highest per capita income in the nation, yet it has three of the country's ten poorest cities. The child poverty rate has increased from 7% in 1989 to 19% in 1995. One out of every 5 children lives below the federal poverty level. CES faculty collaborated with community based organizations to conduct the People Empowering People (PEP) program. PEP focused on working with adults and older youths with limited financial resources in order to enhance their ability to help themselves and their communities. Twenty-four persons from 6 states, CT and South Africa attended a two-day national PEP training conference in Hartford. In addition, 15 people were trained in the PEP model at a 2 ½-day conference with United Way of Central New Mexico.

- b. Impact - Thirty-five adults and 10 teenagers graduated from the program. 81% showed improved communication skills; 78% increased their awareness of positive parenting practices; 81% increased their knowledge of community resources; 93% worked as a team; 100% conducted at least one project; 78% recognized new strengths or skills and 81% shared new skills or knowledge with at least 2 people. As a result of the two training conferences, more than half the participants plan to conduct the program, train others to conduct the program and/or introduce the program to their state administrators. More than 90% said the PEP manual and the manual's supplemental materials were easy to use and understand.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Parenting

- a. Activity - Parent Education is a significant social need that impacts people from various socioeconomic groups and at various stages of the life cycle - infants, youths, teenagers, adults and grandparents. Adults and children benefit as parents strengthen their capacity to function as primary caretakers to meet children's physical, social, emotional and intellectual needs to prepare them to succeed in a global environment. The Parenting People Curriculum, designed to enhance healthy family functioning through positive parent-child interactions, communications and discipline techniques, was reached a total of 85 parents.
- b. Impact - Evaluation results by attendees revealed 100% felt better about their parenting practices, 31% improved their parenting skills substantially, 50% improved their parenting skills somewhat, 19% did not change.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Parenting

- b. Activity - A series of three Parenting Apart Workshops on restructuring the family, helping children cope with the divorce, and co-parenting were conducted in conjunction with the Litchfield Court and the School of Family Studies. Fourteen divorce education workshops were conducted with 74 parents participating in the court ordered program.
- c. Impact - Findings from program evaluation indicate that parents in Litchfield County improved their parenting skills through participation in 6 hours of court ordered parenting

classes. Due to the need for programs for Children of Divorce, a grant proposal was developed.

- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Aging

- a. Activity - Southeastern Connecticut's elder population, 60 years old and older, face complex issues affecting their nutritional status. Relocation from a home to a senior housing site, loss of a spouse, changes in health status, difficulty in getting around, food access, and having enough money to buy the foods seniors need are some of the many issues that have a negative effect on nutrition. Many seniors are not consuming adequate calories and fall short of the Recommended Daily Allowance for many key nutrients. The Senior Nutrition Awareness Project (SNAP) developed programs, informational pieces and newsletter topics.
- b. Impact - SNAP staff responded to more than 490 questions from seniors and senior service providers about various food and nutrition issues via the SNAP toll free hotline. Use of the hotline by community members is continually growing due to community outreach efforts. Due to the success of the series vs. the one-time programs, SNAP will continue to deliver nutrition workshop series at sites when appropriate and feasible.
- c. Source of Federal Funds - Grant funds
- d. Scope of Impact - State specific/CT

#### Key Theme - Family Resource Management

- a. Activity - Connecticut's economic climate and welfare reform have increased the number of families seeking financial assistance and counseling from social service agencies. Extension faculty provided program participants with the skills necessary to manage their money and to give parents the skills necessary to teach their children about managing money. The target audiences for whom these programs were provided were limited resource families and individuals enrolled in programs sponsored by agencies working with families-at-risk.

Three Managing Your Money program series were conducted as part of the Communication of Parent Effectiveness Skills program (COPES) at the Danbury Regional Commission on Child Care, Rights and Abuse. One group was composed of English-speaking parents and 2 groups were composed of Spanish-speaking parents. A total of 35 parents participated. Series topics included setting family financial goals;

planning a budget; credit and debt management; reducing expenses; children and money; and resolving consumer problems.

- b. Impact - 93% of participants indicated, on post-program surveys, that they felt better about communicating about money with their partners/spouses. Seventy 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.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Family Resource Management

- a. Activity - Consumer debt has soared in the past five years and has led to an escalating rate of personal bankruptcies. Consumer expenditures by the elderly are expected to grow as much as 20% by the middle of the next century due to the changing elderly population that retire early and live longer. Three times as many single females live below the poverty level than married couples. Connecticut's cost of living ranks among the highest in the country. Extension educators conducted 69 financial management educational programs and participated in three state conferences. Media outreach efforts reached additional 100,000 consumers in Connecticut. A major program effort was the Financial Information Program series attended by over 106 women.
- b. Impact - Evaluations document the positive results this program had on participants. A majority of participants adopted three or more financial practices to improve their financial management. Findings from weekly and follow-up evaluations document the positive results this program had on participants:
  - 47 (94%) increased knowledge of money management
  - 43 (86%) felt better about handling finances
  - 36 (72%) revised or started a financial notebook
  - 16 (32%) started an emergency fund
  - 31 (62%) improved household record keeping
  - 40 (80%) obtained credit in own name
  - 23 (46%) reviewed legal documents and made changes
  - 32 (64%) drafted or reviewed will
  - 22 (44%) plan to consult a financial planner
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Family Resource Management

- a. Activity - MONEY 2000, a new program initiative of the Connecticut Cooperative Extension in conjunction with the National USDA/CSREES Program, was implemented to promote savings and reduce debt. Connecticut participants received start-up record keeping information, quarterly monitoring fact sheets, and financial information designed to increase savings and/or reduce debt. Press releases were distributed statewide and a feature appeared on Channel 8 TV. The national web site MONEY 2000.org served as a resource link for consumer questions about budgeting, investing, and financial planning.
- b. Impact - 218 Connecticut residents enrolled in MONEY 2000 and committed to save \$166,480, including \$59,644 increased savings and a \$106,836 reduction in debt. A program sponsor at The Family Resource Center in Torrington reported: "A sure sign that people were positively impacted and intent on following through is they are still talking about "saving \$2,000 by the end of the millennium" and "paying themselves first."
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

Key Theme - Family Resource Management

- a. Activity - A major consumer education effort involved the education of youth through the LifeSmarts Program using the Internet. Cooperative Extension System 4-H program and the National Coalition for Consumer Education Connecticut Coalition for Consumer Education sponsored the 2000 LIFESMARTS Competition for High School youth in Connecticut. LifeSmarts is a quiz-bowl competition for young people in grades 9-12. Over 70,000 youth demonstrated their knowledge of consumer law, the environment, technology, personal finance and health and safety through the online competition including 200 youth in Connecticut representing eleven schools. Over 40 volunteers and 60 youth participated in the "jeopardy style" consumer education state finals.
- b. Impact - As a result of participating in the Managing Your Money Series, 93% of participants indicated on post-program surveys that they felt better about communicating about money with their partners/spouses. Seventy percent indicated that they had begun to teach their children about money through the use of allowances. Twenty-five percent set financial goals and began savings accounts to reach these goals. Participants indicated that they would save for big-ticket items, such as television sets or furniture, rather than use rent-to-own options.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

Key Theme - Family Resource Management

- a. Activity - Identity theft emerged as major financial crime in the 1990's with the increased ability to collect, compile, analyze and disseminate information. This combined with electronic technologies, including the Internet, has increased the potential for identity theft. A train-the-trainer program, Identity Theft: Protecting Your Privacy and Your Good Name was offered to provide social service providers with the skills necessary to teach their clientele about avoiding identity fraud. A manual and four fact sheets were developed - Strategies for Protecting Your Privacy; Protecting Your Privacy Online; Identity Theft: What To Do If You Become a Victim; and Protecting Children Online. Workshops were conducted for 95 program participants, including social service agency staff and volunteers.
- b. Impact - Post-program surveys indicated that 100 percent intend to share the information with their clientele and other agency staff members. Ninety-five percent indicated that they intend to change their own practices regarding the personal information they give to others.
- c. Source of Federal Funds - Smith-Lever 3 b and c
- d. Scope of Impact - State specific/CT

#### Key Theme - Workforce Preparation - Youth and Adult

- 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. CES/4-H offered youth entrepreneurship programs and work to 142 youth to integrate workforce preparation skills into existing programs and activities. The program fostered the development of skills (SCANS) recognized as critical for entrance into the workforce in the year 2000.
- b. Impact - 142 youth improved their workforce readiness skills in business organization, money management, record keeping, entrepreneurship, interviewing, application writing, getting along with others, public speaking, decision making, problem solving, personal responsibility, time management, customer service, and other basics skill such as reading, math, and listening. Impacts included increased school attendance; improved skills in teamwork, problem solving, money management, decision making, personal responsibility and public speaking. Through a program survey, youth thought being in the Youth Entrepreneur Club taught them the importance of cooperation and teamwork (89%), taught them how to develop and run a business (92%), encouraged them to attend school (98%), and gave them self confidence (94%). Individual youth earned from \$2-\$147.

The 4-H Youth Entrepreneur program was selected as "program that works" and was a video segment on a National USDA Video Conference on Workforce programs. This videoconference was seen in 248 sites. The 4-H Youth Entrepreneur program was selected as an USDA 2000 Program of Excellence.

c. Source of Federal Funds - State funds

d. Scope of Impact - State specific/CT

Key Theme - Information Technologies

a. Activity - The nursery industry is the most significant component of Connecticut's agriculture. Computer technology has been identified as one way that information can be made available to a large audience at all times when personnel is limited. 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. A USDA Higher Education Challenge Grant Program supported development of a Plant Database website. The UConn Plant Database currently contains information about 415 ornamental trees, shrubs, and vines and over 3,500 photographs.

b. Impact - The website received over 100,000 hits per month. Numerous inquiries have been received requesting use of the information and photographs for a variety of purposes. Landscape design firms are using the pictures and text as part of their design presentations, commercial nurseries and garden centers are linking to the pages, and homeowners send many questions in about plants after they have used the website. The Canadian government has even used some images as part of their examinations for horticultural licensing. E-mail feedback on the site has all been glowing and surveys of undergraduate students using the website as a resource in their plant materials courses has all been positive.

c. Source of Federal Funds - Hatch

d. Scope of Impact - State specific/CT



## Connecticut Annual Report of Accomplishments FY2000

### *Stakeholder Input Process*

Stakeholder input activities for the College were significant, and were designed to follow upon efforts that had been initiated prior to submission of the Plan of Work for 2000-2004 (described on pages 226-227). Three major stakeholder input activities were a statewide stakeholder survey process, a stakeholder forum for organizational leaders, and a faculty/staff forum.

### *Stakeholder Input Survey*

A variety of forums and venues were utilized to formally gather input, including statewide workshops, various public events such as fairs around the state, and other formal meetings where interested persons were present. Survey results from a diverse population reflected a wide variety of interests and concerns. Responses were received in the topical areas of agriculture, natural resources, families, youth, and community. In the agricultural area strong support for appropriate pesticide and associated chemical usage was considered important, along with preservation of farmland, pollution reduction, and land development concerns. The area of natural resources saw considerable interest in the issues of air quality, land management, and water quality. Concern for stakeholders in the area of families included childcare, divorce, finances, time management and quality of family life. Youth issues were strongly led by concerns about drugs followed by personal time management concerns such as keeping busy, lack of activities, and peer pressure. Community issues included strong support for conservation of natural resources, environmental protection, land preservation, water pollution, and drug education.

### *Stakeholder Listening Session*

On October 17, 2000 a major stakeholder listening session was sponsored for representatives of virtually all agencies and organizations with which the College interacts. With over 90 attendees present a wide variety of comments were heard around the topical areas of marketing and public relations, collaboration, legislative/budgets, and many program-related needs. In addition, comments were sought around seven initiatives the College has brought forward for funding consideration by the University and State legislature. In general, strong support was demonstrated for the College and its programs, with specific comments offered to better define actions and activities.

### *College-Wide Faculty/Staff Workshop*

On January 19, 2001 faculty and staff considered issues for the College, including comments offered at the October 17, 2000 workshop and the seven initiatives identified above. Numerous comments were offered in support of the directions currently being followed by the College, as well as support and suggestions around the seven initiatives.

## Program Review Process

### a. Merit Review

The merit review process for Connecticut continues to consist of the four components identified in the Plan of Work for 2000 - 2004 (pages 228).

### b. Scientific Peer Review

The scientific peer review process for Connecticut continues to consist of the process outlined in the Plan of Work for 2000-2004 (page 228-229).

## Evaluation of the Success of Multi and Joint Activities

Evaluation of the success of multistate, multi-institutional, and multidisciplinary activities, and joint research and extension activities, in addressing critical agricultural issues identified in the Connecticut 5-Year 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 2000-2004 Plan of Work and those subsequently identified by stakeholders.

In the area of a competitive agricultural system (Goal 1) considerable success was realized in the biotechnology arena through first-time cloning of a calf from an adult cow in the United States and the development of disease-resistant rhododendrons - both of important economic interest. Issues related to land use development and agricultural preservation were addressed through a variety of studies and outreach efforts.

In the areas of a safe and secure food system (Goal 2) research and extension programs addressed a number of important issues including HACCP education programs for food businesses and processors, biosecurity activities on dairy farms to maintain product quality, and PCR development for a variety of foodborne pathogens.

Work in the area of a healthy and well-nourished population (Goal 3) saw a number of projects. Research and extension projects addressed carotenoids and vitamin A, exercise regimes for obese and non-obese children, EFNEP programs for low-income residents, West Nile virus research in crows in southwestern Connecticut, cold water fish intake for pregnant women, and major nutrition educational programs to reach inner city Hispanic residents.

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 pesticide management through IPM and residential water quality programs, nutrient management for producers and land managers, land use and water quality protection for municipal decision-makers, wildlife and fish habitat management for resource managers, and forestry development and management for land owners.

Efforts in the area of enhanced economic opportunity and quality of life for Americans (Goal 5) were many and varied. Included were research projects on major supermarket chain mergers, air quality studies, financial management programs for a variety of audiences, leadership programs for lower income adults and older youth, and youth entrepreneurship programs.

*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 the People Empowering People (PEP) program targeted to low income adults and older youth to develop leadership skills, 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 were impacted through enterprise management projects, and decision-makers in less affluent municipalities benefited through increased natural resource/land use protection programs. Low income adults and school children benefited from a variety of lead pollution prevention education programs.

*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. 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 are 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 programs adoptions. State and local decision-makers were better able to deal with public health issues related to West Nile virus in crows, emissions from automobiles, and lead pollution concerns with youth.



## Multistate Extension Activities - Brief Descriptions

Multistate 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.

In the critical area of food safety, Extension education activities in Hazard Analysis Critical Control Point (HACCP) systems were significant, with a variety of HACCP training programs offered during the reporting period. 40% of survey respondents who attended HACCP courses implemented a HACCP plan as a result.

The Connecticut Family Nutrition Program for Infants, Toddlers and Children (FNP-IT) reached over 200,000 Hispanic adults in Hartford by disseminating the USDA FIGHT BAC! campaigns through television, radio and newspapers. An additional 10,000 target individuals were provided with FIGHT BAC! stickers and pamphlets at health fairs and supermarkets in Hartford.

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 17 states across the United States. NEMO efforts in Connecticut resulted in programs delivered to representatives from virtually all Connecticut towns, with 19 communities revising their comprehensive plans and/or taking other important public policy actions to better protect water resources.

A study of ozone concentrations, the primary air pollutant that exceed EPA health standard in Connecticut, demonstrated that the Connecticut emission-testing program had no effect on ozone levels in the atmosphere. Recommendations from the report are being considered by the State legislature.

Extension efforts in leadership development through the People Empowering People program (PEP) were designed to work with adults and older youth with limited financial resources to enhance their ability to help themselves and their communities. 81% of the 35 adults and 10 teenagers who graduated from the program showed improved communications skills, and a like number showed increased knowledge of community resources, shared new skills and increased awareness of positive parenting practices.

Education about lead poisoning, a serious but preventable health problem, was offered through several educational programs for children, childcare providers and renovators within the Hartford region as well as for various tribal nations from elsewhere in New England. A pilot program for children was adopted for system-wide use in the Hartford school system.

The 4-H Double Dutch Youth curriculum served as the focus of promotion of Healthy People 2010, a program supporting health promoting policies in the community. A considerable increase in knowledge of nutrition by participating youth and parents was demonstrated.

Extension education programs for non-commercial poultry flock owners saw a major increase in adults involved with poultry projects, as well as additional numbers of youth involved in the state 4-H poultry show. Economic impacts were seen with increased feed and equipment purchases across the state.

A weed IPM program enabled farmers to accurately apply herbicides prior to the cropping year. A soil test procedure was developed and tested in trials on vegetable cropland. Possible savings of 40% in herbicide use per acre were realized.

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 to ascertain causes of certain post harvest problems in poinsettia bract disorders yielded fundamental information that will assist in the industry's ability to better manage post-harvest disorders, thereby improving marketability and cost returns to the industry.





## Integrated Research and Extension Activities - Brief Descriptions/Hatch Act

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.

In the area of emerging infectious diseases a research project addressed egg-borne *Salmonella enteritidis* infection, which has emerged as a major public health problem in the U.S. Efforts resulted in the identification and characterization of SE specific attachment proteins that will help to design effective control measures.

The first calf was cloned from an adult cow in the United States and a bull was cloned after long-term culture. The College's Transgenic Animal Facility has several collaborative research projects with leading international animal companies. Research areas include both basic and practical research. Considerable media attention and keynote presentations throughout the world have resulted from these efforts.

Rhododendron disease control, which is a critical concern to this very valuable ornamental crop, was addressed through the development of transgenic rhododendrons that show resistant to *Phytophthora* (root rot), and a diagnostic assay employing PCR.

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. Efforts were underway to develop an effective vaccine against PRRS - a swine disease affecting the industry. A DNA vaccine carrying PRRSV ORF-5 has been constructed.

Involvement by College faculty in a major lobster mortality event in Long Island Sound enabled researchers to identify a parameoba parasite in the neural tissue of lobster as the disease affecting lobster decline. College activity in this issue contributed to congressional involvement in emergency relief actions as well as state level efforts through leadership by the Governor. Additional research funds were attracted for continued efforts in this area.

Research on carotenoids as a dietary source of vitamin A will help support health of the general population through better understanding of intestinal absorption of carotenoids. 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.

Research on the molecular actions of thyroid hormone as it affects fat synthesis and interaction with zinc resulted in the cloning and sequencing of a region of a key enzyme for fat synthesis in the acetyl-coA carboxylase gene. Research to better understand the mode of action of soluble fiber and how it may reverse hyperlipidemia evaluated potential differences

in response between men and women. Results will permit a more accurate dietary recommendation to hyperlipidemic individuals who are at risk for coronary heart disease.

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. Efforts were underway to develop an effective vaccine against PRRS - a swine disease affecting the industry. A DNA vaccine carrying PRRSV ORF-5 has been constructed.

Research was conducted to develop and apply DNA based Polymerase Chain Reaction (PCR) for avian and food-borne pathogens. A PCR for reovirus, adenovirus and a multiplex PCR for avian pathogenic mycoplasmas were successfully developed. In addition, a PCR for food-borne pathogens such as *Salmonella* spp. and *Campylobacter* spp. was developed and is being evaluated.

Research was undertaken to ascertain the presence of human cases of encephalitis in dead crows in southern New York and Connecticut. A demonstration of the presence of West Nile virus in 18 towns within southwestern Connecticut provided a guide for the CT DEP and Public Health officials in introducing limited mosquito control spraying. No human cases occurred in the state. Considerable favorable publicity was realized by faculty in the College for the role they played, including documentation of the first recovery of West Nile virus in North America being published in *Science* (1999: 2331-2333).

Research work on docosahexaenoic acid (DHA) was designed to assess the role of foods with DHA on sleep patterns of newborns. DHA is commonly found in cold water fish such as salmon, herring, and tuna. Results indicated the need for pregnant mothers to consume cold water marine fish as a means to meet the increased need for DHA during pregnancy and will be useful in making dietary recommendations to pregnant women.

**Institution** University of Connecticut  
**State** Connecticut

## Actual Expenditures

Kirklyn A. Year

**3/8/01**

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**Date**

75

## Integrated Research and Extension Activities - Brief Descriptions/Smith-Lever

Integrated research and Extension activities as related to Smith-Lever 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.

The Connecticut Family Nutrition Program for Infants, Toddlers and Children (FNP-IT) reached over 200,000 Hispanic adults in Hartford by disseminating the USDA FIGHT BAC! campaigns through television, radio and newspapers. An additional 10,000 target individuals were provided with FIGHT BAC! stickers and pamphlets at health fairs and supermarkets in Hartford.

Publications were developed to assist in addressing hydrologic issues associated with land use development in Connecticut. Three publications provided information and guidance for general public, local officials and practitioners in the field to determine impacts of land use development on water flow.

A study of ozone concentrations, the primary air pollutant that exceeds EPA health standard in Connecticut, demonstrated that the Connecticut emission-testing program had no effect on ozone levels in the atmosphere. Recommendations from the report are being considered by the State legislature.

Extension education programs for non-commercial poultry flock owners saw a major increase in adults involved with poultry projects, as well as additional numbers of youth involved in the state 4-H poultry show. Economic impacts were seen with increased feed and equipment purchases across the state.

Ongoing diagnostic testing services dealt with 93,167 samples including avian and mammalian serology, microbiology, pathology and mastitis. In addition, education efforts for veterinarians and their clientele were able to reach over 1,300 veterinarians and others.

A weed IPM program was designed to enable farmers to accurately apply herbicides prior to the cropping year. A soil test procedure was developed and tested in trials on vegetable cropland. Possible savings of 40% in herbicide use per acre were realized.

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 to ascertain causes of certain post harvest problems in poinsettia bract disorders yielded fundamental information that will assist in the industry's ability to better manage post-harvest disorders, thereby improving marketability and cost returns to the industry.

Animal production efficiency issues were addressed through a variety of studies affecting the dairy industry. Evaluation of economic impact of rBST use on dairy farms in the state and enabled producers to better assess the benefits of rBST use. A statewide survey revealed that Connecticut residents strongly support the preservation of farmland statewide, and work better clarified current and long term issues related to maintenance and enhancement of Connecticut dairy farmers.