Annual Report of Accomplishments and Results

Maryland Joint Extension and Research Report

On the

Maryland Joint Extension and Research Plan of Work

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For

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Ending September 30, 2002

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Summary

This document constitutes the Annual Report of Accomplishments and Results for the fiscal year 2002 (October 1, 2001 to September 30, 2002) for the research and extension activities in Maryland subject to the Agricultural Research, Extension and Education Reform Act of 1998. This includes activities of the Maryland Cooperative Extension, a joint enterprise of the University of Maryland and the University of Maryland Eastern Shore, the Maryland Agricultural Experiment Station and the research activities at the University of Maryland Eastern Shore.

Accomplishments are reported for the five goals of the US Department of Agriculture as required. The report is organized as follows:

Part A. Planned Programs

REE Goal 1.	To Achieve an Agricultural Production System that is Highly Competitive in the Global Economy
REE Goal 2.	A Safe, Secure Food and Fiber System
REE Goal 3.	A Healthy, Well-nourished Population
REE Goal 4.	Achieve Greater Harmony (Balance) between Agriculture and the Environment
REE Goal 5.	Enhanced Economic Opportunity and Quality of Life for Americans
Goal 6.	Agricultural Communications, Enhancing Customer Service/Satisfaction Information Technologies.
Goal 7.	Multicultural and Diversity Issues

Part B. Stakeholder Input Process
Part C. Program Review Process
Part D. Evaluation of the Success of Multi and Joint Activities
Part E. Multi-state Extension Activities
Part F. Integrated Research and Extension Activities
Appendix: Tables of Resource Expenditures by Planning Goal
(FORM CSREES-REPT 2/00) for:

Multi-state Extension Activities
Integrated Activities (Hatch Act Funds)
Integrated Activities (Smith-Lever Act Funds)

This report of accomplishments and results organizationally corresponds with the original plan of work submitted in 1999. The plan of work can be found at the following web site:

http://www.agnr.umd.edu/intranet/plan99/powoutline.htm

Parts B-F repeat some of the working from the original plan of work for clarity of presentation. Comments and explanations on the Accomplishments and Results added for this report are shown in ***bold italics*** in Parts B-F. Each Part begins on a separate page.

Part A. Planned Programs

Outline of Example Programs

REE Goal 1. To Achieve an Agricultural Production System that is Highly Competitive in the Global Economy

1.1 Adopt management practices for agriculture production that improve profitability and increase efficiencies

Project 1.1.1 - Integrated Beef Cattle Research and Education Project
Project 1.1.2 - Monitoring Approaches and Alternative Control Tactics to Facilitate IPM for Landscape Plants
Project 1.1.3 - Using Animal-harvested Forages to Increase Farm Profits
Project 1.1.4 - Vegetable and Fruit Production (Southern MD Vineyard Team)
Project 1.1.5 - Managing Pests in Organic Crop Production

1.2 Adopt improved farm business management and marketing strategies (Key Themes – Agricultural Profitability, Risk Management)

Project 1.2.1 - The Dairy Analysis Program
Project 1.2.2 - Economic Analysis into the Mechanics, Use and Characteristics of Commodity Cash Futures and Options Markets
Project 1.2.3 - Enterprise Budgeting for Maryland Farms

1.3 Increase the use of appropriate production and marketing strategies for high value products

Project 1.3.1 - Major Program Area: Small Farm Profitability
Project 1.3.2 – Small Farm Success Project

1.4 Increase the investment in agricultural human capital (Key Themes – Managing Change in Agriculture)

Project 1.4.1 – Community Leadership – Public Leadership Development

1.5 Facilitate informed debates of public issues concerning the neighborhood effects of agriculture, such as nuisance concerns and environmental impacts.

Project 1.5.1 – Close Encounters With Agriculture
Project 1.5.2 – Managing Growth in Urban Areas
Project 1.5.3 - Modifications to the CRP/CREP

REE Goal 2. A Safe, Secure Food and Fiber System

2.1 Decrease the number of Maryland citizens at risk for insufficient food availability to meet nutrient needs

Project 2.1.1 – Multi-County. Expand Food Safety Skills and Practices to Citizens.
Project 2.1.2 - EFNEP Helps Limited-Income Families Choose Healthy and Nutritious Foods.

2.2 Improve consumers' knowledge and practice of safe food

Project 2.2.1 – UMES Food Safety Guidelines
Project 2.2.2 - Somerset and Wicomico Counties. Keeping Food Safe in Our Communities.
Project 2.2.3 – All counties and Baltimore City, Food Safety Programs
Project 2.2.4 - Multi-County. Feeding the Children – SAFELY!

2.3 Improve the knowledge and practice of safe food production and handling by commercial and public food industry

Project 2.3.1 - Washington County. Feeding the Community – SAFELY.
Project 2.3.2 - Calvert County. Feeding the Community – Food Safety.

REE Goal 3. A Healthy, Well-nourished Population

3.1 Improve Maryland citizens' knowledge and practice of healthy diet and nutrition behaviors

Project 3.1.1 – Addressing Diabetes in Limited Resource and Minority Comminities.
Project 3.1.2 - Montgomery County. Diabetes Education- Clases para Diabeticos Latinos-Education y Clases de Cocina.
Project 3.1.3 – Multi-County. Nutrition and Health: Obesity
Project 3.1.4 - Allegany County. Folic Acid Education.
Project 3.1.5 - Frederick County. Healthy Lifestyles for Youth.
Project 3.1.6 – Calvert County. School Salad Festival Focuses on Fruits and Vegetables.

REE Goal 4. Achieve Greater Harmony (Balance) between Agriculture and the Environment

4.1 Improve the application and adoption of land-applied biosolids, manure, composted materials, and other organic byproducts.

Project 4.1.1 – Nutrient Management Program.

4.2 Improve water quality through the adoption of sound environmental stewardship practices by the public and municipalities.

Project 4.2.1 - Private Well and Septic System Management.

Project 4.2.2 – Riparian Buffers: Linking Land & Water (Improving Water Quality by Adopting Environmental Stewardship Practices).
Project 4.2.3 - Maryland Residents Receive 'Homework' Assistance
Project 4.2.4 - Volunteers Help Home Gardeners Reduce Pesticide Use
Project 4.2.5 – Increasing IPM Use in Nurseries and Greenhouses

4.3 Maintain a water supply capable of supporting both commercial and private needs today and in the future by protecting and conserving surface and ground water resources.

Project 4.3.1 –Improve Water Quality Through Composting - Growing Container Bell Peppers in Manure Composts

4.4 Maintain a water supply capable of supporting both commercial and private needs today and in the future by protecting and conserving surface and ground water resources.

Project 4.4.1 - Intensive Nutrient Management for Efficient Crop Production
Project 4.4.2 - Constructed Wetlands for Treating Dairy Wastewater
Project 4.4.3 – UMES Best Management Practices (BMPs) recommendations to improve management of P losses
Project 4.4.4 – UMES ASTM standardization process

4.5 Promote the use of rural and urban forest stewardship practices to maintain a sustainable forest resource.

Project 4.5.1 - Coverts Project.
Project 4.5.2 - Protecting and Profiting From Forest Lands

4.6 Improve fish and wildlife habitat and species diversity, as well as promote the use of new management techniques that will manage wildlife and control damage to property, crops, and people.

Project 4.6.1 - Wildlife Habitat

REE Goal 5. Enhanced Economic Opportunity and Quality of Life for Americans

5.1 Enhancing Rural Economic Opportunities

Project 5.1.1 - Developing Rural Economic Strategies

5.2 Adopt effective and responsive policies and programs; Increase ability of Extension faculty to lead Public Issues Education programs; Increase the abilities of Extension volunteers to successfully carry out Extension programs;

Project 5.2.1 – Managing Growth in an Urban State-Strategic Planning for Jurisdictions and State Agencies.

5.3 Adopt effective leadership practices; Increase leadership ability of Youth, Adults, Extension Personnel

Project 5.3.1 – Developing Community Leaders - LEAD Maryland.
Project 5.3.2 - Building Teens for Better Communities (BTBC). Partnership between Institute for Governmental Service (IGS) and 4-H Youth Development.
Project 5.3.3 - Developing the Leadership Capacity of Citizens and Public Officials Institute for Governmental Service (IGS).

5.4 Strengthen skills and knowledge to achieve economic stability

Project 5.4.1 - Maryland Cooperative Extension Personal Finance Seminar for Professionals.
Project 5.4.2 - Anne Arundel County. Financial Stability
Project 5.4.3 - Caroline County. Financial counselor training

5.5 Develop and accept individual, parental, home, financial, and/or community responsibility through work, family and community involvement.

Project 5.5.1 - Maryland Cooperative Extension Child Care Provider Training.
Project 5.5.2 - Calvert County. Welfare to work

5.6 Enhance the attractiveness of Maryland youth to potential employers to enable youth to be productive, contributing members of a global society; Increase the ability of Maryland youth to have caring relationships with family members, peers, and others in their communities; Increase the abilities of Maryland youth to be competent youth leaders with a strong commitment to civic and social responsibility; Strengthen Maryland youth's understanding of the importance of good health and safe and healthy lifestyles.

Project 5.6.1 - Reaching Diverse Audiences: Montgomery County 4-H Helps People with Autism.

5.7 Youth Development - Character/Ethics Education

Project 5.7.1 - Carroll County 4-H Kids On The Block Disability Awareness Program.
Project 5.7.2 - Baltimore City Feeding the Hungry.

5.8 Youth Development - Jobs/Employment, Workforce Preparation

Project 5.8.1 – Somerset County. PowerUP Lab.
Project 5.8.2 - Maryland 4-H Mini-Societies.
Project 5.8.3 – Prince George's County – 4-H After School Summer and Year Round Program

Goal 6. Agricultural Communications, Enhancing Customer Service/Satisfaction Information Technologies.

Goal 7. Multicultural and Diversity Issues

Part A. Planned Programs

REE Goal 1. To Achieve an Agricultural Production System that is Highly Competitive in the Global Economy.

Overview

There are 12,400 farms in Maryland, covering 2.1 million acres; 1.5 million acres are devoted to crops. Total land area in Maryland is 6.7 million acres, with 62,700 employed. Maryland farms are typically small and farmland is expensive. With 169 acres, the average farm in Maryland is the 10th smallest in the nation. The estimated market value of land and buildings per acre is $2,911, the fifth most expensive in the nation. Even though Maryland has one of the most progressive Land Preservation Programs in the nation, three times more farmland is lost to development every year than is preserved. Between 1950 and 1999, the number of farms and acres of farmland has fallen 66 percent and 48 percent, respectively.

Total annual gross farm income in Maryland averages 1.7 billion dollars, with $220million in exports. The important commodities are poultry and eggs, nursery and greenhouse (fastest growing industry), dairy and milk products, feed/food/oil crops, meat animals, and vegetables and fruit. On average, the net income per farm in Maryland is $33,036, while off-farm income averages $20,000. Slightly more than half of the farmers describe farming as their principal occupation. A small percentage of agricultural producers are responsible for the majority of agricultural sales. Farms with gross market sales exceeding $100,000 represent 21 percent of Maryland farms by number, but their sales represent 86 percent of the total sales. Crop damage from deer and geese is estimated at $17 million annually.

The first inventory of Maryland's "green industry" indicated it has a value in sales of $1.15 billion making it the second largest agriculture industry. This industry employees 15,000 and involves 10,000 acres.

The equine industry's first census indicated 87,000 horses, mules & donkeys are in Maryland. This industry employs 38,000 people and involves 685,000 acres. Maryland's equine inventory is valued at $680 million ($7,810/animal) and the value of all equine related assets at $5.2 billion, with $766 million in related expenditures annually.

Maryland's principal agricultural advantage is location to markets. Grain farmers benefit from the poultry industry. Fruit, vegetable, dairy, beef, swine, horticultural products, and other specialty crops are sold to the five million people in the Washington-Baltimore region.

Maryland farmers are older and aging, reflecting a national trend. Maryland farmers average 55 years of age, compared to the U.S. average of 53.3. Maryland residents demonstrate a strong tendency to purchase locally grown commodities and value-added products, support local farmers, and preserve open space. These residents want to preserve and protect such natural resources as the Chesapeake Bay, so environmental concerns about agriculture play an increasing and significant role in the operation of Maryland farms. Maryland's poultry

industry produces the largest dollar value in production and exports a substantial portion of its production.

The primary goals are:

- Adopt management practices for agriculture production that improve profitability and increase efficiencies.
- Adopt improved farm business management and marketing practices.
- Increase the use of appropriate production and marketing strategies for high value products.
- Increase the investment in agricultural human capital.
- Facilitate informed debates of public issues concerning the neighborhood effects of agriculture, such as nuisance concerns and environmental impacts.

Outputs

For REE Goal 1, Maryland Cooperative Extension educators developed 920 programs in 23 counties, Baltimore City, three regions of Maryland, state, multi-state, and national. Topics covered included best management practices, farm business, high value products, development of human capital in agriculture, and public issues education. These programs reached 46,461people.

Outcomes and impacts were measured in individual programs. Examples of these are in the following section.

Maryland's own assessment of accomplishments. Maryland Cooperative Extension is accomplishing the goals of their five-year report. There is a balance of educational programs among the various goals and the Extension Administration Team is pleased with the accomplishments. Evaluations of outcomes from the five-year plan are conducted at the individual program level, not at the level of an aggregated REE goal.

1.1 Adopt management practices for agriculture production that improve profitability and increase efficiencies

(Key Themes – Agricultural Competitiveness, Animal Health, Animal Production Efficiency, Grazing, Innovative Farming Techniques, Ornamental/Green Horticulture, Plant Health, Plant Production Efficiency, Precision Agriculture;)

(Key Themes from Goal 4: Biological Control, Integrated Pest Management. Sustainable Agriculture)

The Maryland Agricultural Experiment Station supports over 100 faculty and over 100 graduate students. Research is conducted both in the laboratory as well as at 10 research farms located off the main campus. Much of the research supported by the Maryland Agricultural Experiment Station has focused upon protection of the Chesapeake Bay. Nearly 40% of all research supported, is directly related to the protection and restoration of resources of the Bay. The other major focus within this goal is the maintenance of

profitable agriculture in an urban environment. Maryland farmers are under extreme pressure from a growing population. Issues such as land preservation, food safety and sustainable agriculture are high priorities.

Examples of research projects include the following:

Project 1.1.1 - Integrated Beef Cattle Research and Education Project

a. Project Statement. The integrated beef cattle research and education project includes research and demonstration efforts aimed at improving the efficiency, profitability and sustainability of beef cattle production.

Predicting Future Growth Potential; a long-term study of the control of growth in beef cattle. The goal of this research is to develop a simple, rapid and inexpensive blood test to identify superior future breeding cattle at the earliest possible age.

Exploring the Use of Ultrasound; a comprehensive assessment of the use of ultrasound technology to evaluate carcass composition in live beef cattle. The goal of this work is to develop a rapid and accurate method to assess key carcass traits in the live animal, improve the accuracy of selection for superior breeding cattle, and reduce carcass variation at the time of processing.

Alternative Beef Cattle Feeding Systems; an evaluation of the use of available alternative and non-traditional feedstuffs in the diets of beef cattle. The goal of this work is to develop feeding systems which maintain animal performance, reduce total feed costs and utilize available byproduct or non-traditional feeds.

Year-Round Grazing Systems; a comparison of pasture and forage production systems to provide extended and year-round grazing opportunities for beef cattle. This includes the combined use of adapted cool and warm season grasses and interseeded legumes to extend the grazing season and provide adequate nutrient flow for all classes of beef cattle.

Assessing Emerging Animal Health Technology; an evaluation of the efficacy and economics of emerging animal health products. Studies have been conducted on the impact of a new sustained release dewormer on growth performance of nursing beef calves and on the efficacy of a complete metaphylaxis program to control bovine respiratory disease in recently weaned feeder cattle.

b. Impact.

- Earlier and more accurate selection of breeding cattle resulting in significantly reduced whole herd production costs ($300-$350/head) compared to traditional post weaning growth evaluation practices.

- Earlier and more rapid assessment of key carcass characteristics associated with added value in beef breeding bulls and heifers.

- Reduced cash feed costs at all stages of the beef production cycle equivalent to a savings of $60 to $140 per head per year.

- Improved rate of weight gain and fed efficiency in growing calves with subsequent savings of $18 to $21 per head per year.

- Reduced morbidity and mortality in young growing beef calves with an overall improvement in production efficiency and profitability.

Research focused on improved methods of early selection will reduce the number of head needed to provide future breeding stock thereby reducing feed needs, waste production and land use by individual beef producing units. Improvements in growth rate, feed efficiency and product (carcass) composition will result in a more consumer friendly product produced more efficiently at a reduced cost. The use of alterative feedstuffs and improved use of pastures and forage will reduce animal competition for human foods such as grains. Advances in the control and maintenance of animal health will reduce the therapeutic use of animal health products, improve beef quality assurance and increase consumer confidence in the safety and integrity of the food supply.

c. **Source of Federal Funds:** Maryland Agricultural Experiment Station, Private Donor Support

d. **Scope of Impact:** National

Project 1.1.2 - Monitoring Approaches and Alternative Control Tactics to Facilitate IPM for Landscape Plants

a. Project Statement. This research develops management approaches that reduce the reliance on synthetic pesticides to manage insect pests in landscapes and nurseries. We have investigated the roles of the fertilization, irrigation, exposure to sunlight, colonization, vegetational complexity and the impact of natural enemies in contributing to the pest status of the azalea lace bug on azaleas. Fertilization, irrigation, exposure to sunlight and colonization events contributed little to the population dynamics of this pest. Vegetational diversity and natural enemies are the major determinants of the status of this insect as a pest in landscape habitats. A second project evaluates boxwood cultivars for their levels of resistance to the boxwood leafminer. This project was conducted at the US National Arboretum and Longwood Gardens and significant levels of resistance to the boxwood leafminer were detected. The mechanism of resistance appears to be antibiosis rather than antixenosis or tolerance. An evaluation of pheromone lures was performed for clearwing borers common in the mid-Atlantic region. A

checklist of borers caught by commercially available lures was completed. Several formulated biological control agents are under evaluation in nursery and landscape settings.

b. Impact.
Economic. By understanding the effect of vegetational diversity on pest occurrence landscapes can be designed to reduce the potential for pest populations to reach outbreak levels. This in turn reduces the maintenance costs associated with landscape management. By producing boxwood that are resistant to their major insect pests nursery growers can realize a significant competitive advantage. Consumers who use these resistant cultivars lower their maintenance costs. Plant growers and landscape managers who use pheromone traps will treat clearwing borers in a more efficacious manner thereby reducing losses in production and maintenance. Using microbial biological agents reduces the reliance on synthetic pesticides in nurseries and landscapes.

Product Quality. Product Quality is improved through pest resistant landscape design, use of resistant plant cultivars, and pinpoint application of insecticide treatments will result on better plant quality.

Environmental
Reduced use chemical insecticides to produce plants and maintain landscapes will reduce adverse impacts on beneficial insects and non-target organisms found in nurseries and landscapes. Reduced insecticide inputs reduce the risk of environmental contamination in the sensitive ecosystems surrounding the Chesapeake Bay.

Human/Animal Health
A reduction in insecticide sprays to control insect pests reduces exposure of humans and animals to dangerous insecticides thereby reducing health risks. The use of biological control agents instead of these insecticides further reduces risks to animals and humans.

Social
Maintaining the beauty of landscape plants increases the aesthetic quality and value of home, commercial, and institutional landscapes.

c. Source of Federal Funds: Hatch Project MD-H-188

d. Scope of Impact: National

Maryland Cooperative Extension educators developed 452 programs that were held in 23 counties, Baltimore City, three regions in Maryland, statewide, multi-state, and national. Topics covered were best management practices for plant, poultry, and animals systems; geographic information systems and biotechnology; optimizing pasture and forage

resources on the farm; economically sound alternatives that mitigate runoff of nutrients and pesticides from the farm; and the use of nutrient management plans on small farms. These programs reached 15,560 people.

Examples of educational programs include the following:

Project 1.1.3 - Using Animal-harvested Forages to Increase Farm Profits

a. Project Statement. The objective of this Extension program is to increase farm profitability through the reduction of farm expenses with a secondary objective of attracting the next generation to the farm by improving the farm family's quality of life.

Farmer-to-farmer discussion groups such as pasture walks provide a viable means of disseminating information. These two-hour workshops take place on farms currently practicing management-intensive grazing (MiG). Producers are able to witness first-hand, the practices that make MiG effective. This year, 294 producers participated in 11 walks in Frederick County. This represents a 14% participation increase over 2001. An additional 51 producers and agri-service representatives were reached with research-based information on grazing systems during farmer workshops in Frederick and Howard Counties. During 2002, eleven dairymen have requested individual assistance in setting up at least a portion of their operation into grazing. This is one more than last year, illustrating the continued need for producers to cut production cost to remain competitive.

b. Impact. Based on financial data from 36 Maryland farms, of which 12 are grazing operations, graziers have a higher per hundred pounds of milk sold and per cow with only slightly lower total dollar profits compared to confinement operations. Most of this increase comes in the form of decreased purchased feed expenses. On a per-hundred pounds of milk sold (cwt) basis, net farm profit of the graziers is 46% higher than that of confinement herds ($3.49 vs. $2.39 per cwt). The graziers profits are accomplished with 31 fewer cows per herd and 3,300 pounds less milk per cow. This demonstrates that high farm profits can be achieved without expanding herd size or chasing high production per cow.

Ag Agents, have continued grass variety trial research at the WMREC. Three years of data collection from replicated plots is completed. To simulate grazing, these plots are harvested every 13 to 30 days. Nearly 4,000 lunch bag sized-samples have been collected, weighed, dried and weighed again as part of this project. Date analysis will be completed following the 2002 harvest season.

c. Source of Federal Funds: Smith-Lever 3B&C and state general funds

d. Scope of Impact: Multi-County Specific

Project 1.1.4 - Vegetable and Fruit Production (Southern MD Vineyard Team)

a. Project Statement. The Southern Maryland Vineyard Team has established an experimental vineyard at Upper Marlboro Research & Education Center. Twenty-seven different wine grape varieties or clones were planted in 2001 to determine which varieties are best suited to Maryland. It is expected different varieties will produce unique Southern Maryland wines. Wine quality is a function of grape chemistry, which is highly variable according to environmental conditions. The vision is to identify several vinifera varieties that will produce unique premium wines, either as varietals or as blends. The reason to fix on the idea of unique wines is that such wines will develop their own markets. Fine restaurants and retail wine outlets will feature a local wine if it is both unique and has high quality.

The Southern Maryland Vineyard Team has utilized the research vineyard at Upper Marlboro as an educational tool since its inception to promote the growth of a wine industry as part of the following events:

- July 25, 2001-Introduction to Grapes Twilight
- October 11, 2001-Maryland Agricultural Commission Tour
- January 8, 2002-Beginners Grape Growers Workshop
- February 6, 2002-Southern MD Vegetable & Fruit Meeting
- August 8, 2002-Summer Twilight Fruit Meeting
- June 21, 2002-Vineyard Pest Management

b. Impacts. Results and outcomes include the following:

- Membership in the MD Grape Growers Association has risen from 130 to 200 in 2002.
- Over 115 landowners attended a beginning grape growers workshop.
- Over 850 farmers and extension professionals have been exposed to grape growing techniques.
- This is a cooperative effort with 5 states, with strong research ties with Pennsylvania and Virginia.
- Updated Extension Bulletin 242, "Small Fruit Production Guide."
- The annual meeting of the National Professional Society for Viticulturist and Enologists was brought to MD for the first Time.
- Established MD Quality Wine Alliance (MDQWA) with the Association of MD Wineries.

c. Source of Federal Funds: Smith-Lever 3B&C, state general funds and Tri-County Council

d. Scope of Impact: Multi-State & Multi-County Specific

Project 1.1.5 - Managing Pests in Organic Crop Production

a. Project Statement. Organic crop production is one of the fastest growing segments of Maryland agriculture. Organic farmers strive to manage arthropod pests by a combination of cultural and biological strategies. Pesticides are used only as a corrective tool to resolve specific pest problems. Unlike conventional pesticides, the effectiveness of these products is not well documented by scientific experimentation. There has been limited research directly focused on organic production systems throughout the United States, including Maryland.

University of Maryland scientists and extension agents in cooperation with colleagues at the Maryland Department of Agriculture, conducted on-farm studies to evaluate the effectiveness of inoculative releases of Mexican bean beetle parasitoids in combination with the use of a trap crop and neem-based bioinsecticides. Results indicate that an early season trap crop of snap beans followed by releases of parasitic wasps can suppress pest populations below damaging levels. Field tests also identified several new insecticides that are effective and economically feasible for control of problematic insect pests in organic crop production.

b. Impact. Organic crop production can provide a profitable alternative for new farmers and a means of enhancing profitability for conventional farmers. This project provides effective and environmentally compatible management strategies that minimize organic crop losses. Results will have a major impact on the sustainability of organic production and allow for market expansion by Maryland organic growers. The project also will leverage additional funding from public and private sources to support a long-term organic research and educational program for Maryland.

c. Source of Funding: Hatch Act, Smith-Lever 3(b) & (c), special research grants and State funding

d. Scope of Impact: Multi-county & Multi-State

1.2 Adopt improved farm business management and marketing strategies

(Key Themes – Agricultural Profitability, Risk Management)

Maryland Cooperative Extension educators offered 124 programs in 16 counties, Baltimore City, three regions in Maryland, state, multi-state, and national. Topics included improving profitability, liquidity, solvency of farm operations through improved record-keeping systems; increasing the use of information systems; improving short and long-run business planning; managing agricultural enterprises through a better understanding of tax policies, federal programs, and other federal/state policies; and reducing financial risks through forward pricing, crop insurance mechanisms, and diversification of farm level enterprises. These programs reached 1,137 people.

Examples of educational programs include the following:

Project 1.2.1 - The Dairy Analysis Program

a. Project Statement. Farm Financial Management. The objective of this program is to help Maryland farmers improve their business management skills to improve management productivity, increase profitability, and fulfill their long-term goals. It is accomplished through workshops, seminars, and individual on-farm consultations involving farm business management, strategic and tactical planning, record keeping, financial analysis and computer applications for farm managers, educators, lenders, and others. Workshops and seminars are prepared and conducted at the request of, and in teamwork with Extension Educators, Specialists and others. This program has a major focus on dairy farms and small farms. Currently, 40 farms participate in this program. The program involves adaptive research on business planning techniques, crop and livestock enterprise analysis, farm machinery economics, crop insurance, computer use in agriculture, economics of alternative agricultural enterprises and economics of sustainable agriculture methods. The program is also carried to the College Park campus through the AREC 306 Farm Management course. The program methods and results are described below.

b. Impact. Business Planning for Maryland Agribusinesses - This method was developed in 1998 and continued through 2002. Its objective is to provide managers of commercial farms, small farms, greenhouses, and nurseries with education and assistance in developing effective business plans for their businesses. A business plan is a set of detailed written documents that will help them manage their operations in the short-term and long-term. It is an organized collection of all the important ideas that include mission statements, annual goal statements, resource inventories, marketing plans, production plans, financial plans and business structure plans. A business-planning seminar has been presented to a total of 546 farmers as part of the Frederick County Small Farm education series since 1996, with 71 participating in 2002. Each farm business tells a different success story as farms grow, diversify and plan for the future. As examples (Washington County): Arthur's boys took over the business, Charles sold the business to his son, Harold's boys are expanding the operation, and Leverne and Dwight are planning to buy and Harry just purchased the family farm. The Dairy Analysis program (1997-2001 data) shows dairy grass managers net $103 more per cow per year than conventional MD dairy farms.

c. Source of Federal Funds: Smith-Lever 3B&C and state general funds

d. Scope of Impact: Multi-County Specific

Project 1.2.2 - Economic Analysis into the Mechanics, Use and Characteristics of Commodity Cash Futures and Options Markets

a. Project Statement. Current research (extension) has focused on conducting experiments with market professionals - specifically the Chicago Board of Trade pit traders. Dr. Haigh continues to be activily involved into the research of optimal hedging strategies and price discovery. Recently he has appled Directed Acyclic Graphs to market data to assess causation within and amongst markets. His research is the first to conduct experiments on professionals that drive market prices. From an applied (extension) perspective Dr. Haigh applies his futures and options experiences to the 'real world'. For instance, since arriving at Maryland he has trained many milk producers across the state how to use options to minimize risk (and lock in profits). Another area of extension work has been training producers how to effectively use crop insurance with futures and options contracts. Indeed, in crop year 2001/2002, Dr. Haigh was the co-PI on a project to train MD grain producers. Lastly, amongst other extension programs, Dr. Haigh has worked closely with various stakeholders across the state to explain and quantify the importance of the Port of Baltimore to local prices. His analysis illustrated that Maryland producers are likely to lose a considerable amount of money if the Pier, that recently collapsed at the Port is not repaired.

b. Impacts. Several producers have since written to local extension agents indicating the success of this strategy and several producers have saved thousands of dollars. This research contributed significantly in policy analysis. Immediately after the crop insurance training, the Maryland Department of Agriculture reported a huge increase in enrollment for Crop Insurance. The dollar value savings are being determined this year (in another study conducted by Dr. Haigh) but given the massive reductions in crop yields in 2002/2003 the savings are expected to be enormous. Dr. Haigh currently teaches both undergraduate and graduate courses in commodity futures and option markets.

c. Source of funds: Smith Lever 3 b & c and MDA state funds

d. Scope: Multi-County

Project 1.2.3 - Enterprise Budgeting for Maryland Farms

a. Project Statement. This method involves (1) identifying alternative crop, animal, and recreational enterprises for Maryland Farm Managers, (2) estimating output levels, output prices, input requirements, input prices, and profits from alternative enterprises, and to (3) estimating labor, management and financial requirements for different enterprises. A team of faculty from the Department of Agricultural and Resource Economics, including regional specialists conduct this Extension program.

b. Impacts. As a result of this seminar, the farmers had a working knowledge of how to develop and use enterprise budgets for their own farm businesses. This

program resulted in Maryland farm managers having objective methods for evaluating alternative enterprises that they are considering. There were numerous requests for these budgets during the year 2002. As result of 26-grain marketing meetings in Queen Anne's County, 38 farmers had reported that they had increased their cash grain receipts by 22 cents per bushel on corn, 19 cents per bushel on beans, and 11 cents per bushel on wheat.

c. Source of funds: Smith-Lever 3b&c and state general funds

d. Scope: Multi-County

1.3 Increase the use of appropriate production and marketing strategies for high value products

(Key Themes – Adding Value to New and Old Agricultural Products, Diversified/Alternative Agriculture, Niche Market, Organic Agriculture, Small Farm Viability).

Maryland Cooperative Extension educators offered 172 programs in 14 counties, three regions in Maryland, state, multi-state, and national. Topics included increasing access to markets by profitably selling high-quality ornamental horticultural products; practicing post-harvest handling techniques to increase product quality and improving market access; adding value to traditional agricultural products; and increasing economic bargaining power of small and part-time farmer by cooperative bargaining. These programs reached 3,096 people.

Examples of educational programs include the following:

Project 1.3.1 - Major Program Area: Small Farm Profitability

a. Project Statement. According to the 1997 U.S. Census of Agriculture, the number of full-time farms decreased 12 percent from 1992 to 1997. The USDA defines a small farm as one having a gross farm income of less than $100,000 per year; therefore 90 percent of the farms (1,304) in Frederick County are small farms. The future of agriculture and Extension depends on the sustainability of these farms as agricultural small businesses. Educating new farm operators on the basics of agriculture, farm/business management, and marketing is essential to their financial success.

The Beginning a Successful Small Farm Operation educational series was developed in 1996 in Frederick County to provide an opportunity for small farm operators to obtain basic education in agriculture, marketing, and business. Since 1996, the educational series has consistently maintained a strong participation by the small farm segment of the agricultural community in Central Maryland. Between 1996 and 2002, 591 small farm operators from around the Central

Maryland region have attended 11 basic farming small farm series and three specialty courses on enterprise development.

As a result of this series in Frederick County, four other Maryland Counties (Howard, Harford, Cecil & St. Mary's) have initiated a similar program, utilizing the core curriculum developed in Frederick County.

b. Impact.
In 2002 Agents in 5 counties developed 13, two-hour classes for the continuation and expansion of "Beginning a Profitable Small Farm Operation". These programs were a cooperative effort with county Agents, MCE regional and state specialists, FCS and AGNR educators teaching program curriculum. The small farm series was attended by a total of 116 persons in 2002.

In post-program evaluations, the series participants rated all of the classes as excellent. Results of a follow-up survey conducted at the end of the year show that the 52 respondents: Gained a Better Understanding of Farm Operation 4.7 (5-Best), Utilized Information Taught 4.3 (5-Best), More Knowledgeable About Agriculture 4.5 (5-Best), More Clearly Defined Farming Operation 3.9 (5-Best). Agents working with the Maryland Small Farm Cooperative, developed a marketing opportunity with the Great Frederick Farm Farmers Market, where the cooperative will be a featured market participant. This will provide an excellent opportunity for small farm operators to sell their products. Specialty and non-traditional products will be featured. A group of 21 farmers will be cooperating to staff and supply products for this marketing venture. Fourteen farmers have committed to producing non-traditional crops/products for this innovative market. MCE agents are also working with a Virginia Extension Educator and a private entrepreneur to develop a new web-based farmer's market for this area. Twenty-two fact sheets have been developed and one fact sheet on marketing is in the final stages of being published through MCE.

c. Source of Federal Funds: Smith-Lever 3 B & C and state general funds

d. Scope of Impact: Multi-County Specific

Project 1.3.2 - Small Farm Success Project

a. Project Statement. A coalition of nonprofit organizations, Cooperative Extension Services, and USDA-Agricultural Research Service (ARS) in the Mid-Atlantic region is dedicated to helping small and emerging farmers improve their financial success. With funding from the USDA's IFAFS program, the coalition developed an initiative entitled, The Small Farm Success Project, to help farmers: 1) effectively use consumer research and direct marketing techniques; 2) develop sustainable and profitable crop rotation strategies; and 3) adopt financial strategies that enable farmers to remain viable.

Researching and developing new market opportunities for small farmers:
The marketing component of the Small Farm Success Project has focused on four main activities: 1) the development of case studies and profiles that examine the successes and key challenges of innovative marketing methods in the Mid-Atlantic; 2) the offering of marketing education through workshops and demonstration/field days; 3) the creation of a Community Farm Initiative (CFI) in Southeastern PA; and 4) the awarding of small grants to producers and groups in the Mid-Atlantic for marketing activities.

Rotation Schemes in High-Value Cropping Systems in the Mid Atlantic:
The production component of the Small Farm Success project is focused on cultural practices for small farms where sustainable agriculture methods are used. The high population concentrations throughout the region provide many direct market opportunities for farmers. In addition, the mild climate is conducive to the production of a wide variety of crops over a long growing season. One of the goals of this project is to develop models for crop rotation schemes on small acreages used for diversified high value crops. At the outset of the project, we determined that we would document the rotation schemes currently used by small farmers in the region.

Financial strategies that enable small farms to remain viable through the use of an entrepreneurial website: To improve farm efficiency and profitability of their farms, particularly small and medium size farms, farmers need easy access to good management information and tools that will help them make decision in all aspects of the business including strategic and tactical business planning, marketing, record keeping and financial analysis, enterprise selection, and production.

b. Impacts:

- Bruce Mertz (Future Harvest) and Lydia Oberholtzer (Wallace) have interviewed farmers for their marketing profiles. Their publications include Small Farm Success: Profiles of Rural Innovation and Small Farm Success: Community Supported Agriculture.
- John Berry developed a Farmer's Guide to Processing and Selling Meat or Poultry and Produce Packing Guidelines.
- We are supporting relevant portions of the annual conferences for Future Harvest/CASA (Bruce Mertz), and PASA (Lamonte Garber) and the Mid-Atlantic Direct Marketing Conference.
- John Berry (Penn State) offered three marketing workshops for farmers in the Summer 2001, Lamonte Garber and Kate Francis (PASA) offered 7 workshops for farmers in Summer 2001 and 13 workshops in 2002, and Skip Kauffman and Mark Davis led 3 workshops in 2002.
- Lamonte Garber (PASA) is leading the creation of a Community Farm Initiative in Southeast Pennsylvania.

- Jim Hanson (U of MD) and the team organized an individual farmer and group marketing small grants program. We had 64 proposals for $142,133.18 and were able to fund 37 grants for $64,457.00.
- The team presented our results at the National Small Farm Conference in September 2002 in Albuquerque, New Mexico.
- Dale Johnson and Susan Schoenian have developed a web page for farmers, **http://www.smallfarmsuccess.info/**

c. Source of Funds: Smith-Lever c B & C and USDA IFAFS

d. Scope of Impacts: Regional-Multi-State

1.4 Increase the investment in agricultural human capital (Key Themes – Managing Change in Agriculture)

Maryland Cooperative Extension educators offered 12 programs in 6 counties, three regions in Maryland, state, multi-state, and national. Topics included farmers understanding issues facing agriculture and natural resources and improving their leadership skills; improving management and personnel skills; and farm families improving the transfer of management skills from one generation to the next. These programs reached 459 people.

Examples of educational programs include the following:

Project 1.4.1 – Community Leadership (Public Leadership Development)

a. Project Statement. The world is becoming increasingly complex. People communicate more quickly, are increasingly interdependent, and turn more quickly to litigation when they are in conflict. As Maryland's communities adjust to these changes, the value of effective leadership rises. Maryland's increasing urbanization puts new pressures on it's agriculture and natural resources, at the same time that farms and agribusinesses struggle to remain economically viable, environmentally friendly, and good neighbors. To meet these challenges, leaders committed to the future of Maryland agriculture must be able to resolve complex problems successfully in skillful, thoughtful and innovative ways.

MCE provides public leadership development programs for various communities in Maryland. Our standard practice is to provide knowledge and skills to our learners, which will help them solve future problems. We have created several programs designed specifically to increase leadership skills of participants:

LEAD Maryland, which focuses on developing leaders for Maryland agriculture. This is a partnership with the University of Maryland College of Agriculture and Natural Resources, the Maryland Department of Agriculture, the Maryland Farm

Bureau, the Maryland Grain Utilization Board, and the Maryland Agricultural Education Foundation.

The Water Resources Leadership Initiative (WRLI), which focuses on establishing a network of informed and effective leaders who are water resource stakeholders from public and private sector organizations.

b. Impact. The long-run impacts of public leadership development programs are difficult to gauge. One indicator is that participants from prior groups in the LEAD Maryland and WRLI programs have continued their involvement by helping teach, host field trips, and facilitate learning events for subsequent groups. LEAD Maryland has attracted support from over 15 local, state and national organizations and is recognized statewide as a premier leadership program. The start-up summary of LEAD Maryland will serve as a reference and guide for the start up of other agriculture leadership programs. As of 2002, 46 fellows have graduated from the LEAD MD program. WRLI has graduated 50 students as of 2002.

c. Source of Federal Funds: Smith-Lever 3b&c, state general funds and private funding.

d. Scope of Impact: Multi-County Specific

1.5 Facilitate informed debates of public issues concerning the neighborhood effects of agriculture, such as nuisance concerns and environmental impacts.

(Key Themes – relevant themes were not listed in Appendix)

Maryland Cooperative Extension educators offered 55 programs in 15 counties, three regions in Maryland, state, and multi-state. Topics included increasing the knowledge of citizens to better participate in community decisions; better understanding of the role of agriculture in providing them a safe, affordable supply of food and fiber; and public officials making better informed decisions about the neighborhood effects of agriculture. These programs reached 5,216 people.

Examples of educational programs include the following:

Project 1.5.1 – Close Encounters With Agriculture

a. Project Statement. Close Encounters With Agriculture is an outreach educational program geared toward Montgomery County fourth grade students. The entire Montgomery County Cooperative Extension faculty and staff function as a team to present this program. The teamwork aspect of this program has enhanced our offices' ability to team on other programs. It is designed to foster educational awareness about agriculture and its' impact on students' lives. The

program emphasizes nutrition, the environment and their inter-relationship with production agriculture. MCE county Agricultural Agent served as overall chairman of the Executive Committee, coordinating the solicitation of funds, educational materials and promotional items for take home goody bags. This agent also provided leadership for the educational activities conducted in the production agriculture segment of the program and coordinated volunteer participation. Subcommittees for the environmental segment and the nutrition segment were responsible for the development and implementation of those portions of the program. The agricultural program segment consisted of six learning stations featuring live animals with hands on learning activities.

b. Impact. A total of 2,626 students and teachers participated over an 11-day period in 2002. Teacher evaluations and pre/post testing were used to determine program effectiveness. Teacher evaluation scores averaged 4.74 out of 5.0 in the following areas; importance of topics for youth, interest of students in topics, relevance to fourth grade curriculum, appropriateness of materials for age/grade of students and quality of presentations. Students answered an average 22 per cent of pre-test questions correctly and an average of 69 per cent correct on the post-test for the agricultural segment of the program. Pre/Post test questions covered the following topics; number of sodas sweetened by one bushel of corn, average number of 1/4 pound hamburgers from one steer, gallons of milk produced in one day by a typical dairy cow, botanical classification of soybeans, and finished swine market weights. Cooperating agencies and organizations solicited and recruited by this agent included the Montgomery County Farm Bureau, the Montgomery County Soil Conservation District, the Natural Resources and Conservation Service, the Montgomery County Agricultural Center, the Montgomery County Farm Services Agency and the Maryland National Capital Park and Planning Commission. The Marriott Corporation solicited by the Family and Consumer Science Agent also participated. A total of 140 volunteers and staff assisted in the delivery of the program. Volunteers assisted with teaching in a variety of areas and with other aspects of the event. Farmers donated time, produce, livestock and other agricultural products essential for conducting the program. Volunteers donated an estimated 1232 hours for this program. The National 4-H Council values volunteer hours donated to non-profit agencies at $14.83 per hour. Based on these criteria, the total monetary value of the hours donated to Close Encounters would be $18,270.00.

c. Source of Federal Funds: Smith-Lever 3b& c, state general funds and private donated hours.

d. Scope of Impact: County Specific

Project 1.5.2 – Managing Growth in an Urban State

a. Project Statement. Maryland has two regions identified as the second-most and the ninth-most threatened farming regions by an American Farmland Trust report. The Maryland Office of Planning predicts that if current trends continue, 500,000 more acres of open land will be lost to development over the next 25 years (Bay Journal 1997).

University of Maryland MAES & MCE faculty developed a multi-disciplinary research effort in the Patuxent watershed to analyze the evolution of land-use change. Their goal: to determine how policy mechanisms, land-use controls, nonpoint source pollution regulations, wetland permitting and transportation affect farmland loss and residential development patterns. They also developed farmland-owner workshops on tax issues related to agricultural land preservation.

b. Impact: Additional funding granted for Farmland Protection under the 2002 Farm Bill. Increased citizen and farmer involvement in the development of comprehensive plans. Legislation introduced in Maryland House to grant tax-free easement payments. Assessment of important agricultural lands needing protection improved.

c. Funding sources: Smith-Lever 3(b) & (c)

d. Scope of Impact: Multi-County Specific

Project 1.5.3 - Modifications to the CRP/CREP

a. Project Statements. After listening to farmers' concerns regarding the CRP/CREP program (a program designed to pay landowners to take land out of production and plant it to buffer strips - acronym: Conservation Reserve Program/Conservation Reserve Enhancement Program) MCE began the planning process to conduct a forum with policy makers at the state level and cooperating directly with local Soil Conservation District manager. A Program was held on the Eastern Shore. This forum allowed farmers to express their concerns about the program. Key issues were farmers renting land were not notified by the landowner about the land being enrolled in CREP, federal regulations require landowner to notify farmer renting the farm; no farmer representation on state planning committee; and 300' buffers are too wide and only impact wildlife not water quality. MCE State Specialists actively participated in the development of the new State regulations for the new USDA CREP agreement.

b. Impacts: MCE's planning initiative has already resulted in 5 farmers being appointed to the State CREP Advisory Committee. MCE Educators were actively involved in initiating changes in the new State agreement with USDA. Specifically, changing buffer width to reflect buffer function and field characteristics, tenant farmer notification by landowner and creating a sliding scale for the CREP rental payments.

c. Source of Funds: Smith-Lever 3b&c and state general funds.

d. Scope of Impact: Statewide and Nationally

Part A. Planned Programs (continued)

REE Goal 2. A Safe, Secure Food and Fiber System

Overview

There is a need to improve food safety at all points in the food production and distribution chain. Although few data are available specifically for Maryland, the issues in our state are similar to the national issues outlined in the Food Safety Initiative. These issues affect everyone from food producers and processors to retailers, food service handlers, and consumers. HACCP (Hazard Analysis Critical Control Points) is a systematic way of implementing preventative measures to ensure food safety and includes contamination prevention, detection, and ongoing monitoring. As a part of HACCP and new food safety inspection initiatives, rapid pathogen detection and food borne illness monitoring programs will be needed from the farm to the processing plant to the retailer. Model HACCP programs for these various clientele need to be available. Extension and Experiment Station research programs need to develop better pathogen detection and monitoring techniques. The HACCP, Good Manufacturing Practices (GMP), and Sanitation Standard Operating Procedures (SSOP) requirements must be met, but the average small to medium food producer, processor, direct marketer, distributor, and retailer in Maryland will need support and training to do so.

Consumers are frequently unaware of basic tenets of food safety: the importance of cooking and storage temperatures and the need to wash hands and utensils frequently. Consequently, almost 50 percent of food borne illness is estimated to be caused by improper handling or preparation by the consumer.

The primary goals are:

- Decrease the number of Maryland citizens at risk for insufficient food availability to meet nutrient needs.
- Improve consumers' knowledge and practice of safe food handling.
- Improve the knowledge and practice of safe food production and handling by commercial and public food industry.

Outputs.
For REE Goal 2, Maryland Cooperative Extension educators developed over 400 educational programs, which were held in 23 counties, Baltimore City, all three regions in Maryland, statewide, multi-state, and national. Topics covered were food insecurity and hunger, food safety for consumers and food safety for commercial enterprises. These programs reached over 10,000 people.

Outcomes and impacts were measured in individual programs. Examples of these are in the following section.

Partners in these programs included Maryland Food Council, Center for Poverty Solutions, Maryland Food Bank, Capitol Area Food Bank, Maryland Food Hospitality Education Foundation, Restaurant Association of Maryland, school systems, county health departments, the Maryland Department of Health and Mental Hygiene, county social services departments, the Maryland Department of Human Resources, the Eastern Shore Health Education Center. Cooperation with other members of the land grant system included VA, West VA, DE, NJ, and PA.

Maryland's own assessment of accomplishments. Maryland Cooperative Extension is accomplishing the goals of their five-year plan. There is a balance of educational programs among the various goals and the Extension Administration Team is pleased with the accomplishments. Evaluations of outcomes from the five-year plan are conducted at the individual program level, not at the level of an aggregated REE goal.

2.1 Decrease the number of Maryland citizens at risk for insufficient food availability to meet nutrient needs

(Key Theme – Food Security, Food Resource Management)

Hunger and food insecurity affected 10.5% of the U.S. households in 1998. USDA's report on Household Food Security in the U.S., Economic Research Service (2000) indicated that Marylanders are disproportionately affected by food insecurity. In 1996-1998 7.1% of Maryland's households were food insecure, with 40% of these clustered Baltimore City. While urban poverty is a serious issue, Maryland's rural population also suffers from serious lack of access to food resources. This issue especially affects children. Maryland Cooperative Extension educators developed at least 95 programs, which were held in 18 counties, Baltimore City, three regions in Maryland, statewide, multi-state, and national. With a goal of increasing awareness and application of knowledge and practice of safe food handling, all nutrition education classes reflected a food safety component. Topics covered were food sources and availability, purchasing and preparation. These programs reached approximately 3,200 people. Feeding the Community, Safely! and Feeding the Children, Safely! were presented to 1,115 participants through 45 educational programs in 11 Maryland counties during 2002. A 14% improvement was recorded through pre and post-test scores.

Examples of educational programs include the following:

Project 2.1.1 - Multiple counties. Expand Food Safety Skills and Practices to Citizens. One county example:

a. Project Statement. Because food safety is a vital community concern, four classes, lasting three hours each, were conducted for 115 individuals. MCE's 'Feeding the Community Safely' program was adapted for use with childcare providers, school food service association members, and community groups who handle food. A weeklong safety display was designed and exhibited in local grocery stores to promote National

Food Safety Education Month. Over 500 'Fight Bac' brochures and other locally produced educational handouts were distributed during these events.

b. Impact. Pre and post assessments indicated an improvement in food safety knowledge since pre-test scores averaged 4.7 out of 8 in comparison to 7.1 on the post-test. At pre-test, 57.1 % of the participants knew that foods had to be reheated to 165 degrees F, in comparison to 94.4% at post-test time. Over 92% reported they planned to change food preparation strategies to prevent foodbourne illnesses leading to health care cost savings.

c. Source of Federal Funds: Smith-Lever 3B&C and state general funds

d. Scope of Impact: Multi-County Specific

Project 2.1.2 – EFNEP Helps Limited-Income Families Choose Healthy and Nutritious Foods

a. Project Statement. Eating a healthy diet can be a challenge for anyone, but it's an even greater challenge for individuals and families with limited resources. Extension's Expanded Food and Nutrition Education Program (EFNEP) at the University of Maryland helps limited-income families and youth acquire knowledge, skills, attitudes, and behavior changes necessary to maintain nutritionally sound diets and enhance personal development. EFNEP adults are taught individually or in small groups by Extension Nutrition Assistants trained by Extension Educators. EFNEP youth are taught in summer or year-round enrichment programs conducted at public schools, in after-school programs by 4-H staff and volunteers or EFNEP staff.

b. Impact: In 2002 twenty-five (25) Extension Nutrition Assistants reached 2,961 families with 10,506 members, as well as an additional 13,077 young people. As a result of their participation in EFNEP 88 percent of adult participants showed improvement in one or more food resource management practices, 91 percent showed improvement in one or more nutrition practices, and 75 percent showed improvement in one or more of the food safety practices. When it comes to youth participants, 92 percent of 7,231 youth now eat a variety of foods, 90 percent of 7,189 youth increased knowledge of the essentials of human nutrition, 91 percent of 6,518 youth increased their ability to select low cost, nutritious foods, and 89 percent of 6,191 youth improved practices in food preparation and safety.

c. Source of Federal Funds: EFNEP Program funding and state general funds

d. Scope of Impact: State-wide

2.2 Improve consumers' knowledge and practice of safe food handling

(Key Theme – Food Safety)

The effects of washing with 10% salt and phosphate solutions on physical, sensory, and microbial properties of frozen chicken breasts were studied. Washing with trisodium phosphate (TSP) or sodium tripolyphosphate (STPP) significantly improved microbial, textural, and sensory properties of frozen chicken breasts.

Examples of educational programs include the following:

Project 2.2.1 – UMES Food Safety Guidelines

a. Project Statement. The study was done to model the kinetics of C*ampylobacter jejuni* survival on cooked chicken breast patties and in broth as a function of temperature. A three phase linear model fit the primary survival curves well at all incubation temperature, regardless of model medium. Lag time and specific death rate were calculated from the primary survival model at each temperature. Secondary models that predicted lag time and specific death rate as a function of temperature were also developed. The Davey and Boltzmann models were identified as appropriate secondary models for lag time and specific death rate, respectively, based on goodness of fit (r^2) and prediction bias (B_f) and accuracy factor (A_f) tests.

b. Impact. This study helps to provide safe handling practice guideline for poultry products. The data collected in this study will be incorporated into the USDA, ARS Pathogen Modeling Program, where they can be used to predict the risk of *Campylobacter*

c. Source of Federal Funds: USDA/CSREES, Evans-Allen.

d. Scope of Impact: national and regional.

Project 2.2.2 - Somerset and Wicomico Counties. Keeping Food Safe in Our Communities.

a. Project Statement. This program reached over 500 individuals in a series of food safety and nutrition education programs. The objective was to enable participants to recognize the causes of foodbourne illness and learn to make appropriate changes to insure a healthy and safe food supply.

b. Impact. A follow-up evaluation study of the total participants revealed the following: 85% gained new knowledge of food safety practices, 82% implemented one or more new practices recommended at a food safety seminar, and 78% stated they would attend another program on food safety

c. Source of Federal Funds: Smith-Lever 3b&c and state general funds

d. Scope of Impact: Multi-county Specific

Maryland Cooperative Extension educators developed over 200 programs, which were held in 23 counties, Baltimore City, three regions in Maryland, statewide, multi-state, and national. Topics covered were proper food storage, safe food handling practices, sanitation, and environmental issues relative to food safety. These programs reached over 5,000 people.

Examples of educational programs include the following:

Project 2.2.3 - All counties and Baltimore City, Food Safety Programs

a. Project Statement. Programs were developed to educate participants on the risks, occurrence and prevention of food-borne illness. Participants in food safety programs were taught about the incident rates of food-borne illness, bacterial growth, hand washing and safe purchasing, storage and preparation of food. Class format involved hands-on activities, lecture, and group discussion. Participants have included foster parents, day care employees, Women, Infants and Children (WIC) recipients, EFNEP staff and EFNEP participating families, FSNEP staff and FSNEP participants, Family Studies teachers, public school students, food bank employees. Regional farmers were also instructed on safe handling, storage and shipping of fresh fruits and vegetables.

b. Impact. In one county alone, one FCS Educator reached 500 individuals in 20 educational programs. One six-month evaluation mailed to 25 individuals had a response rate of 45%. Ninety percent indicated at least one lifestyle change since the program. Overall, most changes included increased awareness of the danger of food at room temperature ("the two hour rule"), and increased hand washing and prevention of cross contamination. Most indicated that they had an increased awareness of methods to prevent food borne illness. End-of-the class evaluations were conducted for one class. One hundred percent indicated that the hand washing information and activity was useful, 95% indicated increased knowledge about handling and storage of high-risk food items and 90% indicated increased knowledge of bacteria and 100% indicated that they would make at least one change in how they handled and/or stored food.

c. Source of Federal Funds: Smith-Lever 3b&c and state general funds

d. Scope of Impact: Statewide and Baltimore City

Project 2.2.4 - Multi-County. Feeding the Children – SAFELY!

a. Project Statement. This is an offshoot of the *Feeding the Community – Safely!* That was developed in fy 2000. A need was identified in the child-care providers training program for food safety education, and thus the original food safety program underwent a major revision to meet the requirements for licensure of child-care providers. A six-person Extension team developed the new program.

b. Impact. A CD Rom containing the complete *Feeding the Children – Safely!* program was developed and has been externally reviewed by several food safety professionals. The new package was presented to all FCS Educators in Maryland. All state Educators were given a copy of the CD containing the complete program.

c. Source of Federal Funds: Smith-Lever 3b&c and state general funds

d. Scope of Impact: Statewide

2.3 Improve the knowledge and practice of safe food production and handling by commercial and public food industry

(Key Theme – HACCP, Foodborne Illness)

Maryland Cooperative Extension educators developed dozens of educational programs, which were held in most counties, Baltimore City, three regions in Maryland, statewide, multi-state, and national. Topics covered were Hazard Analysis Critical control Points (HACCP), Good Manufacturing Practices (GMP), and Sanitation Standard Operating Procedures (SSOP).

Examples of educational programs include the following:

Project 2.3.1 - Washington County. Feeding the Community – SAFELY.

a. Project Statement. Eight programs were developed and taught for 156 licensed Child Care providers, Department of Social Services Assisted Living Care Home providers, local churches kitchen workers, and the Western MD Hospital Food Service Staff using the MCE sponsored Community Food Safety program and kit.

b. Impact. The results of a pre- and post-assessment tool indicated that learning of important food handling practices were adopted. Average number of correct answers on the pre-test was 6.95; and on the post teat was 8.0, on a scale of 10.

c. Source of Funds: Smith-Lever 3b&c and state general funds.

d. Scope of Impact: County Specific

Project 2.3.2 - Calvert County. Feeding the Community – Food Safety.

a. Project Statement. Educational Objective: Calvert County residents will improve their knowledge and practice of food safety. In response to a county outbreak of 30 cases of hepatitis caused from improper hand washing during the fall of 2000, a program was developed to conduct food safety workshops (2.5 hrs.) during 2001 and 10 workshops that reached 100 during 2002. Using the "Feeding the Community Safely" food safety curriculum developed in MD, these classes were offered in cooperation with the Health Dept. Three classes were designed for restaurant managers and employees, 3 for DSS welfare to work clients, and a class for food staff at each of the following: Office on Aging, Headstart Center, DSS Group Home Managers and Catholic Charities Homeless Shelter. At the restaurant employee and Office on Aging staff classes, at least one Co. Food Sanitarian was present to answer questions about the MD food safety regulations**.**

b. Impact. Extension classes reached 45 restaurant/food service staff, 16 Office on Aging staff, 21 welfare mothers who needed this certification for job credentials, 6 Dept. of Social Services (DSS) group home managers, 12 Headstart or Catholic Charities staff. Identical pre and post tests comprised of 11 questions were given to all. On average, only 48% of the restaurant employees passed the pre-test with no one answering all questions correctly; 92% passed the post-test with 40% answering all questions correctly. Headstart staff and group home managers had a lower percentage of persons passing the pre and post-test—about 80% passed the post-test and 25% passed the pre-test. A certificate of attendance was mailed to persons who passed the post-test. A 2001 follow-up evaluations were sent to 50 (restaurant and church volunteer) participants who passed the post-test was returned by 29 or 58%. As a result of attending the MCE program on food safety, 100% said the workshop and certificate helped them in their job or volunteer work, 100% said they have a better understanding of the types of foods that causes food borne illness, 100% said they more often wash their hands with soap and water for 20 sec. before handling food, 97% said they more often cool foods quickly through the danger zone (most common problem in food borne illness), 97% said they had a better understanding of how important their actions were in their job or volunteer work**.**

c. Source of Federal Funds: Smith-Lever 3b&c and state general funds.

d. Scope of Impact: County Specific

Part A. Planned Programs (continued)

REE Goal 3. A Healthy, Well-nourished Population

Overview.

Consumers need to choose healthier food behaviors because heart disease, cancer, excess weight and obesity, and osteoporosis lead to increased morbidity, lower quality of life, and, ultimately, premature death. People need to understand food composition and preparation techniques to select and prepare nutritious foods. Otherwise, they may avoid nutritious foods and use more expensive and less nutritious foods or mistake the description "low fat" for "low calorie." Consumers need integrated food and nutrition education programming, which must address the interaction of nutrition, diet, fitness lifestyle issues, and physical fitness, in order to be successful in reducing chronic disease risk, excess weight and obesity.

As a result of MCE programs, it was expected that an increased number of consumers would:

- Follow the recommendations of the U.S. Dietary Guidelines and Food Guide Pyramid, including the consumption of five fruits and vegetables per day.
- Correctly use food labels to follow the U.S. Dietary Guidelines and the Food Guide Pyramid.
- Access Extension information on diet, nutrition, and healthy lifestyles.
- Reduce their incidence of diet-related health problems by evaluating their eating patterns and lifestyle practices relative to cardiovascular disease, cancer, diabetes, obesity, and osteoporosis risk and identifying low-risk dietary and lifestyle factors to minimize cardiovascular disease, cancer, diabetes, obesity, and osteoporosis incidence.
- Limit their fat intake to 30 percent or less of energy intake.
- Increase their consumption of calcium-rich food sources.
- Increase physical activity and physical fitness and achieve or maintain a healthier weight.

Outcomes and impacts were measured in individual programs. Examples of these are in the following section.

Partners in these programs included county health departments, the Maryland Department of Health and Mental Hygiene, county social services departments, the Maryland Department of Human Resources, the Eastern Shore Health Education Center, most school systems, the UMCP Department of Health and Human Performance, FSNEP and EFNEP programs. Cooperation with other members of the land grant system included VA, West VA, DE, NJ, and PA.

Maryland's own assessment of accomplishments. Maryland Cooperative Extension is accomplishing the goals of their five-year plan. There is a balance of educational programs among the various goals and the Extension Administration Team is pleased with the accomplishments. Evaluations of outcomes from the five-year plan are conducted at the individual program level, not at the level of an aggregated REE goal.

3.1 Improve Maryland citizens' knowledge and practice of healthy diet and nutrition behaviors

(Key Theme – Human Nutrition, Human Health)

Outputs. For REE Goal 3, Maryland Cooperative Extension educators developed and delivered over 1,000 educational programs which were held in all 23 counties, Baltimore City, three of the three regions in Maryland, state-wide, multi-state, and national. Topics covered were U S Dietary Guidelines, Food Guide Pyramid, consumption of five fruits and vegetables per day, use of food labels, lifestyle practices relative to disease and physical fitness. These programs reached over 50,000 individuals

Examples of educational programs include the following:

3.1.1 – Addressing Diabetes in Limited Resource and Minority Communities

a. Project Statement. Diabetes is a serious health issue for Americans, resulting in total estimated U.S. expenditures attributed to the disease and its complications in 1997 of over $98 billion. The disease disproportionately affects Hispanic Americans and African Americans who are twice as likely as non-Hispanic whites of the same age to have diabetes. The result: some 1.8 million Hispanic Americans and 2.3 million African Americans with diabetes. What has been done? Faculty at the University of Maryland are tackling diabetes among Hispanic Americans and African Americans at the local level, conducting a community-based, interactive education program for low-income minority populations. Developed for low-income, low-literacy populations, the program delivers six hours of instruction. It has been pilot tested in Montgomery County (see next report) and is currently being offered to a number of limited resource communities in Maryland. Classes include basic information about diabetes, its complications, and the importance of taking control of diet, physical activity, and medication. Interactive and collaborative cooking demonstrations emphasize practical tips and guidelines for dietary fat control and blood glucose regulation through diet and lifestyle. Success of the program will be measured by changes in participants' health and lifestyle, such as reduction in intake of total fat and saturated fat consumption, blood levels of glycosylated hemoglobin, increased physical activity and diet management.

b. **Impact.** By providing high-risk populations with information on how they canminimize their risk of getting diabetes and managing diabetes, this program may help reduce the number of cases of diabetes in minority communities and the complications associated with poorly managed diabetes. This will not only improve the quality of life of individuals and their families, but also have a significant impact on health-care costs. Glycosylated hemoglobin tests conducted before intervention and three months after the education intervention indicated a

clinically significant 1.2 percent reduction in glycosylated hemoglobin levels, which bodes well for larger-scale efforts. Curricula developed for low-income, low-literacy audiences can be modified to meet the need of other high-risk populations with diabetes. The program has been delivered to 2,241 participants, and in addition Montgomery County and Prince George's County have developed community resource manuals. A number of counties have also facilitated diabetes prevention activities through health fairs and other public activities.

c. Source of Federal Funds: · Smith-Lever 3(b) & (c), EFNEP Program Funds, state general funds.

d. Scope of Impact: Educators from MCE, in conjunction with their community partners, are delivering interactive Diabetes Education and Cooking Schools in eight Maryland counties (Montgomery, Prince George's, Frederick, Allegany, Somerset, Wicomico, and Worcester.

Project 3.1.2 - Montgomery County. Diabetes Education- Clases para Diabeticos Latinos-Education y Clases de Cocina.

a. Project Statement. There is a need in Montgomery County to provide information and practical instruction to people with diabetes in the Latino community. A large number of Latinos in the county have no health insurance and therefore do not have access to health and nutrition education. Collaboration was formed with the Montgomery County Health Department and the Spanish Catholic Center. *Clases para Diabeticos Latinos* was planned, advertised, and executed by the 3-person team. An animated power point presentation (35 slides) was developed, nutrition lessons planned, and recipes and handouts developed, tested and translated. Flyers and displays were placed at the Wheaton Library and the Spanish Catholic Center. The program was advertised on a local Spanish radio station. A nurse conducted follow-up Hemoglobin A1C tests (definitive blood test that indicates how well the blood glucose levels have been controlled for the past 2-3 months), and initial surveys were completed to provide base line date for evaluation. The classes covered general information on diabetes, problems associated with the disease and the methods of controlling it. Food and nutrition demonstrations provided a means of reinforcing and applying the recommendations given in the classes.

b. Impact. The four part series of classes were conducted in March, April, August and November 2002. A total of 46 patients and 20 family members participated.

- The mean reduction of Hemoglobin A1C levels was 1.25%. (A 1% increase in Hemoglobin A1C values is associated with a $600-$2000 greater per person treatment cost). Pre and Posttest results indicate that participants are eating a greater number of servings of fruits and vegetables and more participants are reading food labels.

- 8 Universities have requested the program on a CD-ROM in fy02.
- Program results were presented to the Bi-county Diabetes Coalition, the Extension Advisory Committee, and Whitehouse representatives.
- The program was selected as an USDA/CREES Program of Excellence.
- The program was featured in the University of Maryland College AGNR 2002 Annual Report and Calendar.
- The project was awarded the National Priester Extension Health Award for Innovative Programming.
- A focus group was conducted in September 2002 for program graduates.

c. Source of Federal Funds: Smith-Lever 3b&c and state general funds

d. Scope of Impact: Multi-county and several states have requested materials.

Project 3.1.3 - Multi-County. Nutrition and Health: Obesity

a. Project Statement. Data from the National Health and Nutrition Examination Survey (NHANES) 1999 indicate that an estimated 61% of adults are overweight or obese, defined as having a body mass index (BMI) of 25 or more. The prevalence of overweight in children is approximately 13%, doubling since the early 1970's. Obesity is a risk factor in the development of a number of chronic disorders such as type 2 diabetes and cardiovascular disease. Actions: MCE, in partnership with the USDA, supported Expanded Food and Nutrition Education Program (EFNEP) and Food Stamp Nutrition Education Program (FSNEP) and are delivering programs within communities which teach adults and youth how to: Eat a healthy diet, read food labels, exercise portion control, reduce fat and kilocalorie consumption. Eat fruits and vegetables (five fruits and vegetables a day). Increase physical activity.

b. Impact. Improvements in dietary fat consumption, label reading, and consumption of fruits and vegetables for participants of EFNEP. Each dollar invested in EFNEP leads to $10.64 savings in future health care costs.

c. Source of Federal Funds: Smith-Lever 3b&c: EFNEP and FSNEP funds; and state general funds

d. Scope of Impact: State of Maryland.

Project 3.1.4 - Allegany County. Folic Acid Education.

a. Project Statement. Objective: Improve the folic acid knowledge and increase the folic acid consumption among Allegany County women of childbearing age to prevent birth defects. This effort was aimed at educating women of childbearing age about proper nutrition prior to and during pregnancy

through the Expanded Food and Nutrition Education Program (EFNEP). Grant funding was received from the Western Maryland Area Health Education Center to incorporate three separate, individual folic acid lessons into the current EFNEP curriculum. Lessons focused on the importance of folic acid related to the prevention of birth defects, folic acid food sources, and supplementation. All three lessons were taught to 90 females of childbearing age.

b. Impact. A pre- and post-test research design was used to assess the effectiveness of the folic acid educational intervention on the knowledge and behaviors of participants. Prior to intervention, only 67% of participants reported that they understood the function of folic acid in comparison to 100% of participants following the intervention. At pre-test, only 41% of participants could correctly identify the one food from a list of three foods that was considered the best source of folic acid in comparison to 90% at post-test. Following the educational intervention, participants' reported their intake of foods high in folate such as fortified cereals, orange juice, and dark green vegetables was significantly higher than the intake reported on the pre-tests.

c. Source of Federal Funds: Smith-Lever 3 b & c and state general funds

d. Scope of Impact: County Specific

Project 3.1.5 - Frederick County. Healthy Lifestyles For Youth.

a. Project Statements. Objective: Strengthen Maryland youths' understanding of the importance of good health and safe and healthy lifestyles. Health and diet-related conditions are the second leading cause of death in the United States. Escalating rates of obesity are considered a health problem nationwide, as well as in Maryland. Unfortunately, the increasing number of obese Americans is not limited to adults alone; researchers estimate that 25-30% of all children in the country are overweight or obese. Empowering youth through education about healthy lifestyle choices and how they can directly influence family decisions regarding diet and health can help address this problem. Using monies from an FSNEP grant I was awarded, 4-H nutrition education programs were conducted in schools, after-school enrichment and summer programs. These programs were held in collaboration with the Board of Education, YMCA, Big Brothers/Big Sisters, Salvation Army and private day-care facilities. Objectives of the program included introducing youth to safe food-handling practices, trying new or unfamiliar healthy foods; providing healthy snacks that youth help to prepare; increasing consumption of calcium-rich foods and encouraging more physical activity.

b. Impact. Through teacher observation and evaluation, the following outcomes were noted: 1) approximately 90 percent of the youth practiced increased hand washing; 2) nearly 80 percent of the youth were aware of the food-safety dangers

of cross contamination; 3) approximately 75 percent of the youth showed improved knowledge about healthy eating habits and knowledge of healthy food choices; and, 4) nearly 90 percent of the children improved their skill in preparation of healthy foods through hands-on food preparation activities.

d. Source of Federal Funds: Smith-Lever 3b&c; FSNEP grant funds; and state general funds

e. Scope of Impact: County Specific

Project 3.1.6 - Calvert County. School Salad Festival Focuses on Fruits and Vegetables

a. Project Statement. Many children do not realize where food (especially vegetables) come from; the processes involved in planting, growing, harvesting, and preparing it; and its role in good health. According to Maryland Department of Health statistics, only 23 percent of Maryland residents consume five or more servings of fruits and vegetables per day--a key behavior to decrease the risk of heart disease and cancer. What has been done? A Team Nutrition grant provided funds to conduct a gardening and nutrition project in two elementary schools. Second graders grew lettuce and tomatoes from seed to harvest. A Five-A-Day Art Contest took place. Near the end of the school year, salad festivals for the entire school population took place and the children's garden lettuce was combined with other ingredients. Children and teachers wore "veggie" costumes. Stickers were given to children who ate the salad or other fruit or vegetable. Prizes were given to poster contest winners.

b. Impact. Two hundred seventy children learned about growing and caring for a garden. More than 200 entered the 5-A-Day Poster Contest and accurately portrayed what they had learned about the importance of 5 fruits and veggies each day. More than 1,100 children tasted the salad and received stickers. On a follow-up evaluation, 71 percent of teachers/food service staff said they "really liked" the garden project, and 86 percent said they "really liked" the salad festival. Nearly half (46 percent) of the children who took tomato plants home with them harvested tomatoes from the plant.

c. Source of Federal Funds: Smith-Lever 3 b & c, state general funds and state grant.

d. Scope of Impact: County specific

Part A. Planned Programs (continued)

REE Goal 4. Achieve Greater Harmony (Balance) between Agriculture and the Environment

Overview

Maryland has abundant water resources. Surface water provides more than 80 percent of the state's water supply; however, ground water supplies approximately 85 percent of the total water used in Southern Maryland and the Eastern Shore. Studies have shown that both ground and surface waters contain high levels of the nutrients nitrogen and phosphorus (N and P), which adversely affect water quality, aquatic organisms, fisheries, and human health.

Under the Chesapeake Bay agreement, there is to be a 40 percent reduction in nutrient loading into the bay by the year 2000. In agriculture areas, there are concerns about the management of inorganic and organic sources of nutrients and chemicals. In urban areas, nutrients and pesticides enter Maryland's water supply through excessive use of pesticides and fertilizers in horticultural landscape applications (commercial, public, and private). According to the 1990 census, one in five residences in Maryland have private septic systems bringing the state's total to 316,000. It is estimated that 60 percent of these systems are failing and that they contribute substantial amounts of nitrate to ground water. Other water-related issues include salt-water intrusion in coastal areas caused by high water demand and competition for finite supplies of water among residential, agricultural, and industrial uses.

Economic and demographic changes have led to a continuing loss of agricultural and forest land. These losses raise concerns about the continuing viability of agricultural and forest industries, green ways, open space for wildlife, recreational areas, amenities, and environmental quality in general. And the losses are likely to continue to the year 2020 at a rate of over 10,000 acres per year.

Maryland's population is expected to reach over 6 million by the year 2005. This population growth and redistribution, as well as commercial and industrial development, will consume farm, horticultural, and forestland. At the same time, this growing population also will demand more services and products from agricultural, horticultural, and forest industries. Conflicts between agricultural and urban land uses and their impacts on natural resources occur as development takes place in once-rural areas. As development occurs, farm and forestland is fragmented and/or lost, reducing the open space and biological diversity of the area. This forest and habitat fragmentation reduces our ability to manage and maintain the resources of a healthy state. Currently, land-use planning and management issues are being addressed by a wide variety of public and private organizations, which often lack coordination and consistency among their programs and policies. Integrated resource management and landscape diversity are key components of land-use planning, but are often not considered.

The contamination of surface and subsurface water supplies due to non-point source agricultural runoff is among the most serious environmental problems facing American agriculture today. About 60% of the rivers and lakes in the United States are polluted by agricultural runoff; rivers primarily by sediments, and lakes by nutrients. Additionally, surface and groundwater are contaminated by a variety of pesticides, and nutrient sources such as fertilizers and manure. Non-point load of nutrients to surface waters in different regions of the U.S.A. is among the highest priorities in the country. One of the challenges for developing economically sustainable agriculture is to simultaneously reduce non-point source pollution problems and maintain farm and rural industrial incomes at reasonable levels. One solution is watershed-scale planning and management which makes it possible to target Best Management Practices (BMPs) for the greatest improvement in water quality even though watershed planning is much more complicated than field or farm scale planning.

As an 1890 Land Grant institution, UMES is committed to continue the services and applied research we provide our area farmers, watermen and resort residents (Eastern Shore tourism industry). We expect to bridge the agricultural, environment, and renewable natural resource programs and find ways that farmers and businessmen can be economically enhanced while not harming the environment and do so with concern and sensitivity to all facets. Presently many of our scientists (and those at College Park) are seeking solutions to resolve a recent Delmarva disaster that placed farmers, watermen and environmentalists at odds, and resulted in what is believed by the poultry industry to be a rush to judgment by politicians. During the summer of 1997, Delmarva made national news because of fish kills and lesionous fish in the Pocomoke River. The river provides a habitat for numerous fish species and other aquatic organisms and it serves as a source of revenue and recreation for the inhabitants of its watershed. *Pfiesteria piscidia* has been implicated as the cause of the lesions and subsequent death of hundreds of fish. Toxins produced by this microbe are also thought to be deleterious to human health. The primary goals are:

- Adopt management practices for agricultural production that enhance natural resources.
- Improve the application and adoption of land-applied biosolids, manures, composted materials, and other organic byproducts.
- Improve water quality through the adoption of sound environmental stewardship practices by the public and municipalities.
- Maintain a water supply capable of supporting both commercial and private needs today and in the future by protecting and conserving surface and ground water resources.
- Promote environmentally sound land use plans that manage growth and value the benefits to society of farms and forest lands.
- Increase recycling and appropriate product disposal.
- Promote the use of rural and urban forest stewardship practices to maintain a sustainable forest resource.
- Improve fish and wildlife habitat and species diversity, as well as promote the use of new management techniques that manage wildlife and control damage to property, crops and people.

Outputs

For REE Goal 4, Maryland Cooperative Extension educators developed 345 programs in 23 counties, Baltimore City, three regions of Maryland, state, multi-state, and national. Topics covered included water quality, water supply, land-use, recycling, forestry, and fish & wildlife. These programs reached 14,779 people. In addition, through the Home & Garden Information Center, 28,000 calls were received, where expertise and guidance was provided on plant diseases, insects and IPM strategies.

Outcomes and impacts were measured in individual programs. Examples of these are in the following section.

Maryland Cooperative Extension is accomplishing the goals of their five-year plan. There is a balance of educational programs among the various goals and the Extension Administration Team is pleased with the accomplishments. Evaluations of outcomes from the five-year plan are conducted at the individual program level, not at the level of an aggregated REE goal.

4.1 Improve the application and adoption of land-applied biosolids, manure, composted materials, and other organic byproducts.

(Key Themes – Agricultural Waste Management, Nutrient Management, Soil Quality, Yard Waste/Composting)

Maryland Cooperative Extension educators developed 135 programs in 23 counties, three regions of Maryland, state, multi-state, and national. Topics covered included farmers increasing their use of nutrient management plans; farmers avoiding the over-application of phosphorus on soils already deemed to be overloaded; and the farmers and citizens properly applying composted materials, manure, and other organic products to the land. These programs reached 4,780 people.

Examples of educational programs include the following:

Project 4.1.1 – Nutrient Management Program.

a. Project Statement. Maryland's Nutrient Management Program: This program was developed by the MCE in cooperation with the Maryland Department of Agriculture. This program was a result of Maryland's 1998 Water Quality Improvement Act. This act requires farmers to have a "N" and "P" based nutrient management plan on their farm. MCE trains people how to write a nutrient management plan as well as training recently certified Nutrient Management Consultants on program and research updates on components of a nutrient management plan. The majority of recently certified consultants have little or no experience in nutrient management planning. This is the only program of its kind in the State of Maryland. Consultants are instructed in the entire nutrient management planning process. They are given instructions and written information on required plan content established by MDA: potential cost-share resources, data collection, soil and manure sampling and analyses, PSI, nutrient

recommendations and the development of recommendations using computer software, plan delivery, and follow-up. Technical information material is provided for manure spreader calibration, the pre-sidedress soil nitrate test (PSNT), manure quantity generation, and record-keeping. Consultants are provided with information material that they can give to their clients to help them better understand nutrient management and the planning process. Sources of equipment and supplies that may be needed to develop plans are provided. Finally, consultants are introduced to NuManMD nutrient management software and guided through its functions by presentation of an instructional scenario.

b. Impacts. Work continued in enrolling new agricultural businesses in the Nutrient Management program during January 2002, through December 2002, with a 2002 total number of 5400 nutrient management plans written by MCE advisors on over 439,415 acres. All of the agricultural businesses were provided a written nutrient management plan with one-on-one technical service provided by MCE Nutrient Management Advisors.

Eighty clientele, representing agricultural business, nutrient management consultants & advisors, and government agencies, received six hours of classroom instruction in advanced Phosphorous nutrient management. In addition, 200 farmers, agricultural business consultants and government advisors were instructed in basic soil sciences, animal waste and sludge management, and the implications of the 1998 Maryland Water Quality Act. MCE state & regional specialists and county agents provided basic and advanced training programs.

MCE specialists provided 15 educational programs that certified 359 new consultants and 12 continuing educational programs to recertify 106 consultants. County agents taught 50 nutrient management voucher programs to 844 farmers. Thirty-three consultants participated in the field day on Phosphorus Site Indexing in Garrett County.

As a result of farmers concerns for writing plans and number of consultants available in the State, MCE developed a new program in 2002 titled, Producer-Assisted Nutrient Management Planning (PANMP). A number of agricultural producers for writing their own nutrient management plan on a computer, but they do not have the software, training, or certification to successfully complete a plan that meets the specifications of Maryland's nutrient management regulations. The program is delivered by coordination with respective county Agricultural Educators who identify persons in their counties that want to participate. MCE-NMP staff developed a set of documents including a cover sheet and data tables that participants complete prior to the date of the PANMP workshop. Respective county MCE Agricultural Educators and usually three members of the MCE-NMP staff provide participants with instruction, guidance and technical support in a workshop environment. Approximately 25 of these workshops were held during 2002. A total of 153 agricultural operations were represented at these workshops, and plans were completed for 145 operations comprising a total of 16,476 acres.

In 2002, MCE began developing a "Pilot Program" to certify farmers to write their plans. Currently for farm operators to become certified to compile their own nutrient management plans, they must complete a challenging course designed to validate and certify consultants. Currently, many farmers are not able to obtain the services of MCE-NMP Advisors due to excessive workloads of those advisors. Farmers must themselves become certified or hire a private sector consultant in order to comply with Maryland's Nutrient Management regulations. Farmers who complete this program will have a certified nutrient management plan. Farmers who pass the certification exam (given as part of this program), and who complete their nutrient management plan, will be certified. With completion of annual continuing education requirements these farmers will maintain their nutrient management certification and in the future may compile and submit their own nutrient management plans without hiring a consultant or relying on MCE to provide the service.

c. Source of Funds: Smith-Lever 3b&c and state general funds.

d. Scope of Impact: Multi-County Specific

4.2 Improve water quality through the adoption of sound environmental stewardship practices by the public and municipalities.

(Key Themes – Biological Control, Integrated Pest Management, Pesticide Application, Riparian Management, Soil Erosion, Water Quality: Key Themes from Goal 1: Home Lawn and Gardening)

Maryland Cooperative Extension educators developed 215 programs in 23 counties, Baltimore City, three regions of Maryland, state, multi-state, and national. Topics covered included proper applications of nutrients and pesticides by homeowners; increase knowledge of septic systems; municipalities adopt environmentally sounds practices of water and nutrient management; green industries practice bay-wise techniques; developers, loggers, and landowners reduce soil erosion; and increased installation of riparian buffers by landowners. These programs reached 36,950 people.

Examples of educational programs include the following:

Project 4.2.1 - Private Well and Septic System Management.

a. Project Statement. The goal of this program is to educate homeowners on the importance of the maintenance of their private drinking water and onsite sewage systems. It is important for homeowners to understand how water moves through the earth and how a failing or neglected septic system or well could contaminate their drinking water and directly affect environmental and personal health.

Many Maryland residents lack education on their role in water quality degradation. Daily normal activities within homes and yards can contribute to water quality problems. This program has been designed to educate homeowners on how they directly affect water quality. Private septic systems are known polluters of the environment. Most homes with onsite wastewater treatment systems also have private wells for drinking water. It is imperative that both systems are maintained since they are in close proximity. According to the Maryland Department of Environment, more than 30,000 of the existing 427,000+ septic systems in the state are known to be failing, with estimates of 60% suspected to be failing! Yet, thousands more are being installed each year. Most of these failures are due to mismanagement and improper installation. In addition, urban residents are moving to more rural areas and are not familiar with the maintenance requirements of a septic system or well. Realtors and builders selling the homes do not provide information on these systems. Worse, the word-of-mouth information people pass along is usually incorrect.

b. Impact. Seventeen workshops (more than a two-fold increase from last year) were presented to more than 1500 (a three-fold increase from last year) homeowners throughout the State of Maryland. Participants are taught ground and surface water hydrology, how they affect water quality, and well and septic system management.

The Maryland State Realtors Commission, in accordance with the Maryland Realtors Continuing Education Program, has approved and recommended the Regional Specialist's program for continued education certification credits.

[Class evaluation ratings for both the homeowner programs and Realtor programs are consistently 'Excellent.' Comments typically repeated are, "Extremely interesting, entertaining and informative; everyone should be required to take this course." I can tell you what I want, but participant evaluations tell you the true value of my work. Please see attached evaluation summaries, particularly the comments.]

Reaching Realtors throughout the state is an effective front line for dispersal of this information, and will allow a more efficient transfer of this knowledge to the hundreds of thousands of homeowners with these systems. In the past year, over 450 Realtors attended these 3-credit hours courses. To date, over 1,200 Realtors from four regional associations have attended these programs. The program will continue to expand to all county Realtor Associations in the coming years.

In addition to directly educating homeowners and indirectly reaching them through Realtors, more indirect education is taking place by training Master Gardeners to take this information to homeowners. Through the Bay-Wise Master Gardener Program, Master Gardeners continue their education. In this program, they are taught the connection between gardening and the bay. Topics such as

proper fertilizer practices, water conservation, landscaping with water quality in mind, managing household hazardous waste, and the do's and don'ts if you have a private well or on-site disposal system are covered in their course work. They then take this information to their clients. Over 200 Master Gardeners throughout the state were trained in 2002.

c. Source of Federal Funds: Smith-Lever 3B&C and state general funds

d. Scope of Impact: City Specific

Project 4.2.2 – Riparian Buffers: Linking Land & Water (Improving Water Quality by Adopting Environmental Stewardship Practices).

a. Project Statement. Federal, state and watershed organizations have been advocating stream-side or riparian buffers to improve water quality and provide wildlife habitat, especially on water bodies adjacent to agricultural lands. The Chesapeake Bay Program for example has set a goal of restoring forest riparian buffers on 2,010 miles of streams by the year 2010 to help meet its goal of a 40 percent reduction in nitrogen and phosphorus nutrients in the Bay. Maryland set a goal of 600 miles of riparian buffers by 2010. Private landowners own sixty percent of the land nationwide. However, the benefits of the buffers accrue primarily to society as a whole. Because installing buffers is costly, education, technical assistance, and economic incentives are essential to encourage their adoption. Thus effective programs need to be based on adoption information and monetary incentives set to encourage landowner enrollment.

The Riparian Buffer: The Link between Land and Water program sought to educate landowners, technical staff, and policy-makers that riparian buffers are part of a system connecting land-based activities and water. The program incorporated elements of both the physical and social sciences. The program customized its efforts and delivery mechanisms for the different decision makers in the process of riparian establishment with two common components for each part: 1) understanding the science of the riparian system and 2) understanding a landowner's decision making process. Both elements have to be understood to design and implement voluntary incentive programs and/or appropriate regulations, buffer design criteria, and the long-run sustainability of the buffers and their benefits.

Targeting landowners, technical staff and policy-makers, MCE has developed written resource materials (fact sheets and a magazine), a video, and a web-site; has held landowner workshops, a series of two-day technical trainings, and a multi-state satellite training; and participated on numerous committees to increase awareness of the riparian system and to facilitate decision-making to encourage buffer adoption.

Seven fact sheets were written covering the general riparian system, technical issues to consider such as stream bank stabilization, and economic factors. A glossy magazine incorporated many photographs and graphics for easy perusal. A video was developed and is closed captioned for the hearing impaired. The video has been distributed to over 5000 individuals and organizations worldwide. For the computer literate, a web site was created which distributed electronic versions of the fact sheets, training slide shows, reference resources and other web-links. Approximately 2000 individuals "hit" the web site were during the first year online.

http://www.riparianbuffers.umd.edu

In addition MCE conducted a series of two-day workshops directed at technical people. MCE invited researchers and technical people to speak about stream assessment, groundwater hydrology, nutrient cycling, plant and animal communities, economic considerations, and riparian restoration. The second day involved site-visits on farms and urban areas to discuss the appropriate design and site assessment criteria. Over 140 extension agents, Maryland Department of Agricultural Staff and Natural Resource Foresters, Farm Service Agency and Natural Resource Conservation Service field staff, Ducks Unlimited and Chesapeake Bay Foundation staff participated. This approach was duplicated by many of the organizers at the 43 sites that participated in the MCE Riparian Buffer satellite training, which was downlinked in 12 states to over 1,400 people. Several other states (Ohio, Pennsylvania, Kentucky, Virginia) have adapted this format, two-day in-class/in-field, in their educational programs after MCE's success.

b. Impacts: The State of Maryland and the USDA have used MCE's programs and research efforts to train personnel and modify current conservation program policies. Maryland landowners have installed over 600 miles of riparian forest buffers since 1996. They have enrolled over 36,000 acres in grass and forest riparian buffers since 1998 through the Conservation Reserve Enhancement Program. There is some overlap between the above listed milestones.

c. Source of Federal Funds: Smith-Lever 3b&c and state general funds.

d. Scope of Impact: Multi-County Specific

Project 4.2.3 - Maryland Residents Receive 'Homework' Assistance

a. Project Description. When it comes to environmental concerns, people are quick to point their figure at easily identified "villains," such as industry and agriculture. Many are unaware that their own actions can have a positive - or negative - effect on the environment. And although printed materials on water quality protection and other environmental issues are readily available, most of these materials go unread because they are too long and complex, aren't distributed to the right people, or don't contain the information consumers want.

The Maryland Cooperative Extension Service has produced a collection of easy-to-read, understandable materials designed to educate citizens about their role in protecting water quality, their health, and the environment in general. Developed as part of an environmental program called "Maryland HomeWork," the materials are compiled in a looseleaf notebook. Instead of being distributed to anyone and everyone in the hope that it will be read, the notebook has been provided to people attending a series of paired two-hour HomeWork workshops that focus on such topics as composting, water conservation, recycling, well and septic system management, and hazardous household products. In the future, all Maryland HomeWork materials will also be distributed to people attending Extension workshops or seminars on any of the subjects addressed in the notebook. (People interested enough in attending one type of environmental or water quality workshop are most likely to be interested in and benefit from the rest of the HomeWork material.) Three HomeWork Demonstration Homes have been established to showcase the practices suggested in the materials.

b. Impact. Maryland residents will come to understand that they, themselves, are the so-called "bad guy" polluters and that they can help protect water quality and their environment through relatively simple activity changes. Habit changes will improve the quality of water leaving lawns, gardens, and the sewage from individual homes and apartments. People will understand that in addition to protecting the environment, most of these changes will also translate into direct economic savings.

c. Source of Funds: Smith-Lever 3b&c, state general funds & Federal EPA.

d. Scope of Impact: Multi-County & Statewide

Project 4.2.4 - Volunteers Help Home Gardeners Reduce Pesticide Use

a. Project Statement. Because of their desire for beautiful, pest-free landscapes, home gardeners often spray pesticides without first identifying a pest and sometimes apply pesticides even when the pest is no longer active or the plant injury is minor.

The Maryland Master Gardener Program was established in 1978 to teach citizens how to adopt sustainable gardening and lawn care practices and reduce unnecessary pesticide use through the Integrated Pest Management (IPM) approach. University- trained and certified Master Gardeners serve as volunteer horticulture educators, offering IPM education and diagnostic assistance via workshops, classes, plant clinics, information booths, and special programs, like the Bay Wise Gardening Project. They walk clients through the IPM process-from correct diagnosis to monitoring, prevention and-when necessary-making targeted applications of least-toxic pesticides. They also teach home gardeners how to identify and attract beneficial insects. A method for tracking the effectiveness of

IPM recommendations made by Master Gardeners at plant clinics (based on a delayed client survey) was piloted in 2002 in Montgomery County.

b. Impact. In 2001, approximately 220 new trainees completed the Master Gardener training program. Nearly 590 volunteers contributed 37,412 hours of service, valued by the Governor's Office on Service and Volunteerism at more than $580,000. This service included more than 3,100 hours at 17 plant clinics around the state, at which Master Gardeners diagnosed plant and pest problems for more than 2,200 residents.

c. Source of Funds: Smith-Lever 3b&c and state general funds.

d. Scope of Impact: Multi-County

Project 4.2.5 – Increasing IPM Use in Nurseries and Greenhouses

a. Project Description. Nursery, greenhouse and landscape managers in Maryland's second largest agricultural industry (valued at $1.24 B in 2001) require cost-effective and environmentally safe materials and methods to control insects, and diseases and to efficiently use water and nutrients.

University of Maryland faculty have developed a nationally recognized water and nutrient management planning process. They also provide independent IPM scouts and growers with regular updates issues via e-mail and the Internet. An interdisciplinary team of faculty also developed an online water and nutrient management planning course.

b. Impacts:
· Forty-one operations used IPM greenhouse practices in 2002, up from 4 in1996.
· Nine nurseries in 11 counties are actively involved in the IPM program.
· A total of 21 consultants, 31 growers, 20 faculty or state personnel, and 18 students from the United States and several other countries have successfully completed the water and nutrient management planning course.
· Nursery and greenhouse growers submitted 164 water and nutrient management plans to the Maryland Department of Agriculture, and 175 more plans currently are being written.

c. Source of Funds: Smith-Lever 3b&c and state general funds

d. Scope of Impact: Multi-County

4.3 Maintain a water supply capable of supporting both commercial and private needs today and in the future by protecting and conserving surface and ground water resources.

(Key Themes – Drought Protection and Mitigation, Water Quality)

Maryland Cooperative Extension educators developed 64 programs in 12 counties, 3 regions in Maryland, state, multi-state, and national. Topics covered included communities and individuals adopting water conservation practices; and communities and municipalities officials receiving training in ground-water protection standards under the National Drinking Water Act. These programs reached 2,545 people.

Examples of educational programs include the following:

Project 4.3.1 - Improve Water Quality Through Composting – Growing Container Bell Peppers in Manure Composts.

a. Project Statement. Improve the application and adoption of land-applied biosolids, manures, composted materials, and other organic byproduct. Nursery and greenhouse crop producers, landscapers and ground maintenance firms will increase the proper application of composted materials, manure and other organic products to the land. Pollution of Maryland waterways by excess phosphorus and nitrogen is a growing problem. As a result, nutrient management regulations may limit land application of animal manures - rich in both nutrients - in some areas of the state. Given that manure is an unavoidable byproduct of animal production, alternative uses for this waste material must be found.

One possibility involves the use of composted manure products as growth media for container-grown plants. University of Maryland researchers are evaluating the effect of three such products on the growth and fruit yield of container-grown bell pepper plants, comparing them to each other and to a commercial growth media. Specifically, they are looking at composted poultry litter, composted dairy manure, Pro-Mix, and a 1:1:1 mix of composted poultry litter, dairy manure, and Pro-Mix. Plants are being grown in 48 five-gallon plastic containers - half of which were retro-fitted to collect any water draining through them. The water is collected and added back to the containers, creating a closed system.

b. Impact. Large-scale composting of animal wastes helps to stabilize and conserve nutrients, producing a safe, versatile product with uses far beyond nutrient-rich farm fields. Studies such as this one will provide the nursery-and-greenhouse industry with more information about the qualities of animal manure composts in container crop production, helping producers make high-quality composts desirable to home gardeners and landscape, nursery, and greenhouse professionals.

c. Source of Funds: Smith-Lever 3b&c and State General Funds.

d. Scope of Impact: Multi-County specific

4.4 Maintain a water supply capable of supporting both commercial and private needs today and in the future by protecting and conserving surface and ground water resources.

(Key theme - Water Quality and nutrient management)

Overview - Research

The contamination of surface and subsurface water supplies due to non-point source agricultural runoff is among the most serious environmental problems facing American agriculture today. About 60% of the rivers and lakes in the United States are polluted by agricultural runoff; rivers primarily by sediments, and lakes by nutrients. Additionally, surface and groundwater are contaminated by a variety of pesticides, and nutrient sources such as fertilizers and manure. One of the challenges for developing economically sustainable agriculture is to simultaneously reduce non-point source pollution problems and maintain farm and rural industrial incomes at reasonable levels. One solution is watershed-scale planning and management which makes it possible to target Best Management Practices (BMPs) for the greatest improvement in water quality even though watershed planning is much more complicated than field or farm scale planning.

As an 1890 Land Grant institution, UMES is committed to continue the services and applied research currently provided to area farmers, watermen and resort residents (Eastern Shore tourism industry). We expect to bridge the agricultural, environment, and renewable natural resource programs and find ways that farmers and businessmen can be economically enhanced while not harming the environment and do so with concern and sensitivity to all facets.

Primary Goals

- Adopt management practices for agricultural production that enhance natural resources.
- Improve the application and adoption of land-applied biosolids, manures, composted materials, and other organic byproducts.
- Improve water quality through the adoption of sound environmental stewardship practices by the public and municipalities.
- Maintain a water supply capable of supporting both commercial and private needs today and in the future by protecting and conserving surface and ground-water resources.
- Promote environmentally sound land use plans that manage growth and value the benefits to society of farms and forest lands.
- Increase recycling and appropriate product disposal.

- Promote the use of rural and urban forest stewardship practices to maintain a sustainable forest resource.
- Improve fish and wildlife habitat and species diversity, as well as promote the use of new management techniques that manage wildlife and control damage to property, crops and people.

Adopt management practices for agricultural production that enhance natural resources.

Because of the intense competition between farming and the urban population in Maryland, much of our work has focused upon the reduction of chemicals and other exogenous inputs to farming systems. In particular, Maryland leads the nation in the development of nutrient management programs for control and reduction of nutrients on cropland. This effort began with the *Pfiesteria* outbreak of 1997 and has focused on the reduction of phosphorus to farmland. Further, due to the high cost of land and labor in Maryland, we have examined ways to reduce costly pesticide use on both cropland and in the greenhouse. Many of the best programs for reduced pesticide use in the US were developed in Maryland.

Examples of research projects include the following:

Project 4.4.1 - Intensive Nutrient Management for Efficient Crop Production

a. Project Statement. Research program explores the fate of nutrients in agro-ecosystems. Efficiency of nitrogen and phosphorus utilization during different phases of numerous crop rotation systems and the evaluation of the potential for nutrient losses from production soils are the primary objectives of this research program. Nutrients applied to agricultural lands, either as purchased synthetic fertilizers, animal manures, or biosolids have three alternative fates: be utilized by the growing crop; be retained in the soil as components of dynamic nutrient cycling processes; or be lost from the soil by water transport or atmospheric volatilization processes. Nutrient losses from soil can result in detrimental impacts on surrounding natural waters including accelerated eutrophication, aquatic habitat degradation, and impairment of drinking water quality. The goal of our research is to maximize the efficiency of crop nutrient utilization while minimizing the potential for nutrient losses from agricultural land.

b. Impact. The overwhelming majority of the 2 million acres of cropland in Maryland are fertilized with either purchased synthetic fertilizers or animal manures. These nutrient inputs contribute to the cost of production of all commodities. Efficient use of applied nutrients is essential to minimize production costs and sustain farm profitability. Evaluation of nutrient application rate and timing in Maryland's numerous crop production systems permits identification of the most agronomically and economically efficient nutrient

management practices. Refinement of soil testing and other methods used to evaluate soil nutrient availability to crops enables managers to more accurately determine the quantity of fertilizer nutrient input necessary to optimize production and yield.

Adequate nutrient availability to agronomic crops is essential for both maximum production quantity and commodity quality. Grain and forage quality is affected by the balance of nutrients available to the crop during its growth. Soil and plant analyses are useful diagnostic tools for evaluation and management of nutrient availability that in turn determines commodity quality.

Although applied nutrients are essential in Maryland's crop production systems, over application of nitrogen and phosphorus may pose an environmental risk. Nitrogen and phosphorus transport from agricultural soils to surface waters can contribute to the eutrophication of these natural water bodies and spark declines in water quality. Nitrogen leaching through soil to groundwater has been documented as a human health hazard as well as an environmental hazard. Management of nitrogen and phosphorus inputs to cropping systems that ensure adequate nutrient availability to the growing crop while minimizing the potential for excess or residual nutrients to runoff the soil surface or be leached out of the crop root zone has been a primary research focus. Management of soils that have historically received over applications of phosphorus and reducing the potential for phosphorus losses to adjacent water resources is a rapidly expanding research priority.

Preservation of a sustainable agriculture industry in the rapidly urbanizing mid-Atlantic seaboard is a daunting social challenge. Sustainable agriculture is not possible without the use of sustainable nutrient management practices. Environmental protection, habitat preservation, and water quality issues are part of our society's daily conservation and agricultural nutrient management plays a premier role in this social debate.

c. Source of Federal Funds: Hatch Project MD-B-182

d. Scope of Impact: National

Improve water quality through the adoption of sound environmental stewardship practices by the public and municipalities.

Project 4.4.2 - Constructed Wetlands for Treating Dairy Wastewater

a. Project Statement. The focus of this research is to evaluate the effectiveness of wetlands constructed for treating dairy milk house waste. We are collecting monthly data on a suite of water quality parameters from various locations within wetland-based treatment systems. The parameters we analyze include biological

oxygen demand (BOD), chemical oxygen demand (COD), nitrogen (ammonia, nitrate, nitrite, and total nitrogen), phosphorus (ortho-phosphate and total phosphorus), total suspended solids (TSS), pH, electrical conductivity, dissolved oxygen, and temperature. These data allow us to quantify the treatment effectiveness of the various components of the systems. Additionally, we are monitoring vegetation in the wetlands to assess changes in community structure in response to wastewater constituents. Vegetation characteristics we are monitoring include species composition and abundance in permanent plots, the species composition of buried seeds (i.e., the seed bank), and standing biomass of dominant species. Because of the importance of peat formation in the retention of certain nutrients (phosphorus in particular), we are initiating studies of the decomposition rates and nutrient retention capacity in various wetland plant species.

b. Impact. On a regional scale, it is generally less expensive to implement measures for nutrient and solids control rather than to restore ecosystems damaged by these substances. On a local scale, constructed wetlands may be less expensive to operate than conventional wastewater treatment systems. Additionally, with a trend toward having more animals per unit area of farmland, these systems may also have the benefit of requiring smaller land area than some waste management practices.

A better understanding of the factors controlling the effectiveness of wetland-based treatment systems will improve their design and implementation.

Milk house wastes contain high concentrations of solids and nitrogen and phosphorus compounds. These substances can result in eutrophication of downstream water bodies, damaging or altering aquatic ecosystems and the socioeconomic values that depend on them. Wetlands naturally remove solids and nutrients from water flowing through them, and we are harnessing this capacity to remove potentially damaging substances from wastewater before it is discharged to the environment. We have found that constructed wetlands significantly reduce concentrations of nutrients, solids, and oxygen demanding substances in dairy wastewater.

Reducing the quantities of nutrients and solids discharged to aquatic ecosystems will improve the health of aquatic animals. Lower nutrient levels may also prevent outbreaks of microorganisms dangerous to human health such as the dinoflagellate *Pfiesteria piscicida*.

Constructed wetlands offer an alternative to energy- and labor-intensive conventional technologies that may be more socially acceptable in some areas.

c. Source of Federal Funds: MAES, USDA/SARE

d. Scope of Impact: International

Outcomes and impacts were measured in individual programs. Examples of these follow.

This project attempted to determine the effects of treating soils with agricultural gypsum (GYP); fluidized bed combustion fly ash (FBC) and anthracite refuse ash (AFA) to control phosphorus (P) loss from P-enriched soils on the Eastern Shore of Maryland. It also monitored possible groundwater contamination and, the loss of Nitrogen (N) and P due to surface run-off following the application of poultry litter to P enriched soils on the Eastern Shore of Maryland.

Project 4.4.3 – University of Maryland Eastern Shore - Best Management Practices (BMPs) recommendations to improve management of P losses

a. Project Statement. Forty-eight surface runoff boxes, equipped with five gallon water collection containers, were treated with fluidized gas combustion gypsum (FGD), flue bed combustion flyash (FBC) and anthracite refuse ash (AFA). Treatments were mixed into the top 5.08 cms of soil at four rates (0, 10, 20, and 40 g kg-1). Corn (Zea mays) was planted in runoff boxes. At the end of each growing season, corn plants were analyzed for %N, %P, %K, %Ca, %Mg, and PPM concentrations for Mn, Fe, Cu, B, Al, Zn, Na, Cd, Co, Pb, Mo, and Ni . Soil samples were analyzed for pH, total (P, K, Mg, and Ca); total sorbed metals - PPM for Cu, Pb, Cd, Ni, Zi, and Cr. Soil samples were analyzed for acidity (meq/100g), CEC (meq/100g), and % base saturation of CEC (K, Mg, Ca). Run-off water and sediment samples were collected after rain events and analyzed for total-P, available-P and particulate-P. Twenty-four lysimeters were also installed at two depths (30 and 60 cm) and treated with the above amendments to minimize P leaching from the soil profile into ground water. Kentucky 31 fescue was planted to the soil of each lysimeter, and yields calculated in the same manner as give above for corn. Soil and water samples were also analyzed in the same manner as for collection boxes. A second objective of this project was to study effects of manure management on P and N in surface runoff from corn and soybean rotation trials. Thus, poultry litter was applied to the soil to provide amounts equivalent to (N-based/4900 kg/ha), (P-based crop removal/2314 kg/ha) and (P-based/0 kg/ha). Experimental plots were amended with soybeans and corn in rotation with poultry litter only applied to beans. Subsequently, water and sediment samples were collected after rain events and analyzed for total-P, WEP, particulate-P, N03-N and total-N. Soil, water and sediment, and plant samples have been collected for the third year and are being analyzed in the same manner as the run-off boxes and lysimeter studies. Second year data indicate that soils treated with FGD and FBC provided significantly different results than soils treated with ARA ($p< 0.05$). WEP was significantly decreased ($p< 0.05$) in soils treated with FGD and FBC as compared to the ARA treatment. FGD and FBC were found to reduce WEP by approximately 60%and 50%, respectively as

compared to the control. Water sample pH from lysimeters and collection boxes ranged between 6.0 and 7.5. Phosphorus penetration levels into the soil ground water table were also lowered. Third year data are currently being collected and analyzed. Our preliminary results after two years agree with those of Stout et al., 1998 and Stout et al., 2000. Corn and fescue yields were not adversely affected by the use of the coal combustion by-products used in this experiment. Heavy metals levels in the soil as a result of these treatments were also within standards set by EPA. Results from these studies will be used to provide farmers with additional Best Management Practices (BMP) to improve management of WEP losses from high P content soils that have been amended with poultry litter for long periods of time.

b. Impact: On shore land use patterns near and adjacent to water bodies contribute to nutrient loading which promotes algal blooms and loss of fish habitats in the Chesapeake Bay watershed. Researchers at the University of Maryland Eastern Shore and USDA/ARS have found that the application of gypsum-based coal combustion by-products to soils with elevated phosphorus (P) levels can reduce the amount of dissolved P in overland water flow by approximately 50%. Dissolved P in surface waters is immediately available for uptake by aquatic biota and its' control is thus, critical to minimizing short-term impacts of P losses on surface water quality. The use of gypsum-based coal combustion by-products on soil to minimize nutrient loading can save the coal industry millions of dollars each year in sanitary landfill storage cost. These substances also have the potential to provide a cheap and effective means of reducing nutrification in the Chesapeake Bay watershed, which presently has reduced and impaired habitats critical to resident fish and shellfish. Reversing this trend will enhance the ability of waterman to provide quality products in needed quantities, improve the economic viability of Maryland's seafood industry and promote tourism in the Delmarva Peninsula.

c. Source of Funds: Capacity Building/CSREES/Evans- Allen ($38,402)

d. Scope of Impact: Regional-Delmarva Peninsula and Arkansas

Project 4.4.4 – UMES ASTM standardization process

a. Project Statement. - Maryland was responsible for the providing the guidelines and materials for the inter-laboratory study conducted by New York, Illinois and Maryland. This was a part of the ASTM standardization process for the pipette method. The ASTM draft was approved by the sub-committee and has been submitted to ASTM F23 Main Committee for balloting. A draft has also been submitted to ISO to be considered as an ISO standard. In addition, Maryland worked with National Institute of Occupational Health (Spain) and Federal Agricultural Research Center (Germany) to compare the proposed ASTM pipette test method with gutter and atomizer methods to measure protection provided by textile materials against liquid pesticides.

b. Impact. The new standard test method has the potential to be used by researchers, industry, and organizations in the US and other countries to measure the performance of textile materials against liquid pesticides. Better screening methods will be developed, and workers will be better protected.

c. Source of Federal Funds: Evans-Allen- 1890 ($43,691)

d. Scope of Impact: National

4.5 Promote the use of rural and urban forest stewardship practices to maintain a sustainable forest resource.

(Key Themes – Forest Resource Management, Natural Resources Management)

Maryland Cooperative Extension educators developed 38 programs in 10 counties, 3 regions in Maryland, state, multi-state, and national. Topics covered included forest landowners, youth, urban citizens, and conservation groups gaining knowledge in forest stewardship; forest landowners developing and implementing a forest management plan; forest landowners gain knowledge about alternative income enterprises; and natural resource professions will gain knowledge and enhance skills in forest management, alternative income enterprises, technological applications, and public policy conflict resolution. These programs reached 3,593 people.

Examples of educational programs include the following:

Project 4.5.1 - Coverts Project.

a. Project Statement. Volunteer program trains opinion leaders how to improve wildlife habitat through sound forest management practices. Volunteers share information with others in their communities:

MCE regional specialist's provides leadership and makes critical decisions for the Coverts Project and organized the 3 and 1/2-day training workshop with 18 inside sessions and two half-day field tours. Entire program is linked to the DNR Forest Stewardship Program. Under direction of a regional specialist, the project assistant maintains regular communication with cooperators by E-mail and other means, develops newsletters, and provides follow-up and support for cooperators. The extension assistant maintains the database.

About 700 applications were mailed to recruit 45 qualified applicants, of which 30 were selected for the 3.5-day training workshop. A reference manual, signs, business cards, brochures and other aids were developed for program.

b. Impact. Cooperators reported an average knowledge gain of 1.9 points on a scale of 1 to 5 when comparing knowledge level prior to, and after completion, of the training workshop (an increase from 1.6 the previous year). Three newsletters were developed by the project assistant under agent direction to communicate regularly.

- Since 1990, 322 cooperators have been trained - 27 cooperators in 2002. The agent, extension assistant, and cooperators organized a one-day refresher course attended by 38 cooperators that focused on information updates and how to effectively share information with others.
- The annual 2002 survey was sent to active cooperators with 37% (96) returned. Results indicated the following: 10,296 people received information on forest/wildlife management or the Coverts project from all efforts, with 1,251 of those being personal contacts. 68% had organized some event that included forestry or wildlife information, 19% used the media to inform people. Items distributed included: 267 brochures; 342 business cards, as well as reference materials.
- 85% took steps in managing their own properties on a total of 5,347 acres mentioned. About 32% reported that other woodland owners had sought professional management assistance as a result of their efforts, affecting 3,112 acres. Cooperators reporting 2,975 hours devoted to outreach to friends, neighbors and community. 17,282 hours were spent by cooperators managing their own properties. 94% of cooperators indicated they would like to continue as cooperators.
- A large number of cooperators are now involved in leadership roles in state and local natural resource organizations and give credit to Coverts for motivating this interest.

c. Scope of Federal Funds: Smith-Lever 3b&c and state funds.

d. Scope of Impact: Multi-County Specific

Project 4.5.2 – Protecting and Profiting From Forest Lands

a. Project Statement. Forests cover 41 percent of Maryland. Nearly all of this forestland (90 percent) is in the hands of 130,600 private, non-industrial landowners. Increasing fragmentation of these land parcels threatens forest viability. The forest products industry is the fifth largest manufacturing industry in the state, providing more than 42,000 jobs and $4.5 billion in total output.

University of Maryland faculty educate forest landowners about how to care for and profit from their property through seminars, workshops, correspondence courses, web sites, publications, newsletters, videos, and other educational efforts. One newsletter, Branching Out, reaches 5,000 private forest landowners

throughout the state. A network of trained volunteer forest landowners assist in this effort by sharing information with other forest landowners, citizens, and communities through the Coverts Project outreach program.

b. Impact. Since 1990, 297 private landowners and land mangers, called "cooperators," have received training through the Coverts Project. In a typical year, almost 600 people receive information on forest/wildlife management from these volunteers. One hundred and fifteen landowners have increased their forestry and forest stewardship knowledge through the Maryland Forestry Correspondence Course. This course is estimated to have saved landowners more than $80,000.

c. Source of Funds: Smith-Lever 3b &c and McIntire-Stennis

d. Scope of Impact: Statewide

4.6 Improve fish and wildlife habitat and species diversity, as well as promote the use of new management techniques that will manage wildlife and control damage to property, crops, and people.

(Key Themes – Wildlife Management)

Maryland Cooperative Extension educators developed 60 programs in 5 counties, 3 regions in Maryland, state, multi-state, and national. Topics covered included rural landowners gain knowledge of wildlife management and improve wildlife habitat; urban citizens improve knowledge of urban wildlife management; natural resource professionals gain knowledge and improve their skills in wildlife management; urban and rural homeowners and agricultural businesses increase knowledge and understanding of deer and other problem wildlife species and employ wildlife damage control techniques; and local governments gain knowledge about deer and develop successful management strategies. These programs reached 1,615 people.

Examples of educational programs include the following:

Project 4.6.1 - Wildlife Habitat

a. Project Statement. MCE regional specialists' provided training to five 4-H youth in wildlife management in support of the Nat'l 4-H Wildlife Judging contest. Designed the field exercise and management planning questions for the state wildlife-judging contest. Presented a program on wildlife management to twenty-five 4-H youth at the Lower Shore 4-H winter fair. As a result of this program, two 4-H'rs participated in the state wildlife contest held at Keedysville. Also in response to 4-H youth interest in wildlife judging, a MD wildlife-judging manual was developed. This manual will be printed in 2003. Numerous wildlife

fact sheets were developed, such as Bats, Barred Owl and Swallows to support the 4-H and adult programs.

b. Impact. Based on conversations with farmers, wildlife biologists, and extension agents, an estimated 25 farmers have adopted wildlife planting as a result of this fact sheet. MCE regional specialists' taught a class on ecology and ecosystem services to 25 Master Gardeners at Adkins Arboretum. End of class evaluations were high (4.7) for teaching effectiveness and delivery (4.7). A series of 18 wildlife fact sheets were reprinted based on county and farmer needs.

Provided four 2-hour trainings for new and old master gardeners in Howard, Harford, Frederick Counties, as well as the state workshop on managing deer damage. Attended by at total of 75 people, there was a 250% increase in knowledge reported on all topics covered for the Harford and Howard County presentations. Estimated potential savings over the last year if attendees had training information available at that time was $30,500. Sessions lead to many follow-up.

c. Source of Federal Funds: Smith-Lever 3b&c and state general funds.

d. Scope of Impact: Multi-County Specific

Part A. Planned Programs (continued)

REE Goal 5. Enhanced Economic Opportunity and Quality of Life for Americans

Overview.

Maryland youth, families, and communities are the core components in increasing quality of life and economic opportunity. Currently, 13 percent of Maryland children ages 18 and under live in poverty. A single parent heads more than one fifth of families with children. Increases in parenting outside of marriage continue to create difficult consequences for women, children, and taxpayers.

The current welfare-to-work effort in Maryland requires families to develop the skills and resources needed for independent living by placing a 60-month maximum time limit for welfare benefits. As parents leave welfare to go to work, additional childcare providers are needed.

The process of public decision-making is currently a significant issue for Maryland citizens and policy makers alike. Land use, food safety, and childcare are examples of potential issues involving public decision-making. Because of the inherent difficulty of the situation, it is not uncommon for critical public decisions to be postponed, indefinitely tabled, or solved in uninformed ways.

Societal and governmental needs are growing more complex, fractionated, and global. Increasingly, citizens are asked to share leadership roles in their communities. New and replacement intergenerational leaders must be prepared for these civic challenges. Youth and adult leaders must have the skills, confidence, and ability to lead diverse groups in difficult situations involving polarization of opinion, civic disengagement, and conflict.

Volunteers provide educational, economic, and social benefits to families, individuals, organizations, and communities. Over 4,000 adults and 2,000 older teen leaders serve as Extension volunteers. Effective selection, training, involvement, and guidance are essential steps in maintaining and strengthening volunteer efforts.

The primary goals are:

- Resolve differences between competing interests/conflict management.
- Increase ability of Extension faculty to lead public issues education programs.
- Increase the ability of Extension volunteers to successfully carry out Extension programs.
- Adopt effective leadership practices and strengthen leadership competencies.
- Strengthen skills and knowledge to achieve economic stability.
- Develop and accept individual, parental, home, financial, and/or community responsibility through work, family, and community involvement.

- Enhance the attractiveness of Maryland youth to potential employers to enable youth to be productive, contributing members of a global society.
- Increase the ability of Maryland youth to have caring relationships with family members, peers, and others in their communities.
- Increase the ability of Maryland youth to be competent youth leaders with a strong commitment to civic and social responsibility.
- Strengthen Maryland youth's understanding of the importance of good health and safe and healthy lifestyles.

Outputs.
Maryland Cooperative Extension educators developed approximately 3, 000 educational programs, which were held in all 23 counties, Baltimore City, all three regions in Maryland, statewide, multi-state, and national. Topics covered were youth development, volunteer leadership and development, strengthening family life, family economic stability, parenting and child-care, welfare-to-work, public issues education, training of local officials, and resolving differences. These programs reached almost 100,000 people.

Outcomes and impacts were measured in individual programs. Examples of these are in the following section.

Partners in these programs included the financial industry, many youth-serving agencies and groups, childcare provider organizations, National 4-H Council, county health departments, the Maryland Department of Health and Mental Hygiene, county social services departments, the Maryland Department of Human Resources, the Eastern Shore Health Education Center. Cooperation with other members of the land grant system included VA, UDC, and all states in the NE Extension Region.
A few examples of the many public issues around which MCE has recently worked include:

Riparian buffers;
Public drainage on the Eastern Shore;
Grandparents as parents;
Affordable rental housing;
Agricultural conservation and commodity policies.

Maryland's own assessment of accomplishments. Maryland Cooperative Extension is accomplishing the goals of their five-year plan. There is a balance of educational programs among the various goals and the Extension Administration Team is pleased with the accomplishments. Evaluations of outcomes from the five-year plan are conducted at the individual program level, not at the level of an aggregated REE goal.

5.1 Enhancing Rural Economic Opportunities

Maryland Cooperative Extension educators developed 26 programs, which were held in 12 counties, Baltimore City, all three regions in Maryland, statewide, multi-state, and

national. Topics covered were identifying policy alternatives and their consequences, negotiating skills, identifying common ground, planning and implementing steps to reduce friction, appraising community benefits resulting from resolution of differences. These programs reached approximately 900 people.

Examples of educational programs include the following:

Project 5.1.1 Developing Rural Economic Strategies.

a. Project Statement. Business and job retention and expansion are critical to nine Eastern Shore counties. MCE Rural Development Center at UMES in cooperation with counties has received over $12 million in grants to provide: revolving loans, technical and marketing assistance, research, feasibility studies, planning, heritage and nature-based tourism, and micro-business assistance.

b. Impact.

- Invested $1.8 million in 158 Eastern Shore development projects (average $11,279 investment) and leveraged $10.3 million in local share investments, total of $12.1 million.
- Lent $12 million to over 50 manufacturing businesses in cooperation with the 4 Lower Shore Counties. Leveraged $60 million private lending. Impacted 4,000 jobs.
- Assisted the 4 One Maryland designated counties (Caroline, Dorchester, Somerset and Worcester) to develop implementation plans for funding under the program.
- Adoption and implementation of 4 county Comprehensive Economic Development Strategies.

c. Source of Federal Funds. Smith-Lever 3 b&c, state general funds and USDA Rural Development grants.

d. Scope of Impact: State of Maryland, particularly the Eastern Shore. Multi-County Specific.

5.2 Adopt effective and responsive policies and programs; Increase ability of Extension faculty to lead Public Issues Education programs; Increase the abilities of Extension volunteers to successfully carry out Extension programs;

(Key Theme – Community Development, Public Issues Education)

Maryland Cooperative Extension educators developed over 100 programs, which were held in 23 counties, three regions in Maryland, statewide, multi-state, and national. Topics covered were policy development, public issues processes, conflict management, negotiating, and collaboration skills, framing public policy issues and including public issues education (PIE) in scope of work. Also, strategic planning processes, financial

management, performance measures, and organizational climate, assessing local needs, evaluating the effectiveness of programs as part of the "Excellence in Governance Certificate Program." These programs reached approximately 2,000 people.

Examples of educational programs include the following:

Project 5.2.1 Managing Growth in an Urban State-Strategic Planning for Jurisdictions and State Agencies.

a. Project Statement. Maryland has two regions identified as the second-most and the ninth-most threatened farming regions by an American Farmland Trust report. The Maryland Office of Planning predicts that if current trends continue, 500,000 more acres of open land will be lost to development over the next 25 years (Bay Journal 1997).

University of Maryland faculty developed a multi-disciplinary research effort in the Patuxent watershed to analyze the evolution of land-use change. Their goal: to determine how policy mechanisms, land-use controls, nonpoint source pollution regulations, wetland permitting and transportation affect farmland loss and residential development patterns. They also developed farmland-owner workshops on tax issues related to agricultural land preservation.

b. Impact. Additional funding granted for Farmland Protection under the 2002 Farm Bill. Increased citizen and farmer involvement in the development of comprehensive plans. Legislation introduced in Maryland House to grant tax-free easement payments. Assessment of important agricultural lands needing protection improved.

c. Funds: Smith-Lever 3b&c and state general funds.

d. Scope of Impact: State of Maryland.

5.3 Adopt effective leadership practices; Increase leadership ability of Youth, Adults, Extension Personnel

(Key Theme – Leadership Training and Development)

Maryland Cooperative Extension educators developed over 200 programs, which were held in 23 counties, Baltimore City, three regions in Maryland, statewide, multi-state, and national. Topics covered were assessing leadership skills, team building, conflict management, communication, personnel and volunteer management, motivation, and team building. These programs reached over 4,000 people.

Examples of educational programs include the following:

Project 5.3.1 Developing Community Leaders - LEAD Maryland.

a. Project Statement. The world is becoming increasingly complex. People communicate more quickly, are increasingly interdependent, and turn more quickly to litigation when they are in conflict. As Maryland's communities adjust to these changes, the value of effective leadership rises. University of Maryland Extension faculty are involved in offering public leadership development programs for various communities in Maryland. Partners in the program include the College of Agriculture and Natural Resources, the Maryland Department of Agriculture, the Maryland Farm Bureau, the Maryland Grain Utilization Board, and the Maryland Agricultural Education Foundation. The purpose of LEAD is to provide men and women interested in agriculture the opportunities to improve leadership, develop a network of diverse people, and increase understanding of critical issues. Twenty-three Fellows were selected for the 18-month program. The students completed 8 three day seminars, a three day trip to Washington DC, and a ten day international study trip. Teaching methods included field visits, assessments, panels, case studies, presentations, and self-discovery. Following completion of an application process and interviews, 23 new Fellows were selected to start Class II in February 2002. This class traveled to Cuba and will graduated in early 2003. Class III will start with 23 new students in January 2003.

b. Impact. All 23 Fellows of Class I completed the 37-day program. At the end of the program, Kellogg Foundation met with the Fellows and published a written report commending the program. Three of the Fellows were elected to the LEAD Maryland Advisory Board. All of the graduates continue to be involved in nurturing the program and mentoring the new Fellows. The program has attracted support from over 15 local, state and national organizations.

c. Source of Funds. Smith-Lever 3b&c and state extension funds and over $220,000 from non-profits and foundations; tuition from Fellows.

d. Scope of Impact. State of Maryland

Project 5.3.2 Building Teens for Better Communities (BTBC). Partnership between Institute for Governmental Service (IGS) and 4-H Youth Development.

a. Project Statement. BTBC began is a tri-state effort to apply the youth as partners approach with the implementation of a small-scale community development project. Four teams of 26 youth and eight adults learned and practiced leadership skills, developed new perspectives on community and worked on a community project. An additional 15 teens and 3 adults participated in the latter phase of the program. The teams came from diverse backgrounds including a rural church group, a suburban 4-H teen council, a newly formed teen association in an urban working class community, and a teen group in an urban

public housing project. Cooperating with IGS and the Maryland Cooperative Extension were the Maryland 4-H Tech Corps, Maryland Safe and Sound Program, Rutgers Cooperative Extension, Center for Innovation for Community and Youth Development at the National 4-H Center, Hagerstown Boys and Girls Club, Hagerstown Housing Authority, Baltimore County Recreation and Parks, Maryland Save Our Streams, and the NJ Kids Educational Enrichment Programs.

b. Impact. Three of the four teams successfully completed their community projects. Assessments done at the beginning of the project and the end indicate the teens changed positively in terms of their perceptions of self-empowerment, ability to talk to outside groups, and planning skills. Two new teams were started. A handbook, *Building Teens for Better Communities Tool Box*, was published and distributed to Extension across the country. Two workshops were presented at the National 4-H annual meeting and abstracts published. Currently, this publication is selling well across the states for use by numerous youth development organizations.

c. Source of Federal Funds: Smith-Lever 3b&c and state extension funds; two Maryland Cooperative Extension Program Development grants; and Northeast Regional Rural Development Center grant.

d. Scope of Impact: Multi-state: MD, DE, NJ, and WV

Project 5.3.3 Developing the Leadership Capacity of Citizens and Public Officials Institute for Governmental Service (IGS).

a. Project Statement. Since January 1999, Extension Specialists at IGS have coordinated and provided most of the teaching for a leadership program called the Water Resources Leadership Initiative (WRLI). During that period, 63 individuals have become active Fellows in WRLI. While most WRLI Fellows are Marylanders, a person from VA (a local Extension Educator) and a person from PA are also in the program. WRLI Fellows meet with IGS faculty and with other teachers for six three-day sessions during their first year of the program. During their second year, the Fellows complete applied practicum projects. Twenty six Fellows have completed their practica and graduated; seventeen are working on their practica; and twenty have completed the first of their six sessions.

b. Impacts. Fellows increase their leadership capacity by enhancing their knowledge and skills about water policy development, collaborative group processes, and leadership knowledge and skills. In addition, they are creating a network of people – across state, agency, and organizational boundaries – for working together to solve water issues.

c. Source of Funds: Smith-Lever 3 a & b and state general funds. Start-up funds provided by the Economic Development Administration through the Rural

Development Center, University of Maryland Eastern Shore. The program has become self-supporting. Federal agencies that are participating in the program include: EPA and NRCS/USDA.

d. Scope of Impact: MD, PA and VA. Discussions are taking place with people in NC and DE, and WV.

5.4 Strengthen skills and knowledge to achieve economic stability

(Key Theme – Estate Planning, Family Resource Management, Retirement Planning)

Family financial management is critical to achieve financial security for all consumers and families in Maryland. MCE provides research-based financial management educational programs to diverse audiences including youth, women, minorities, immigrants, self-employed individuals, farm families, first time home buyers, employees, military, childcare providers, small business owners, senior citizens, government agencies and human service providers, working poor and other limited resource individuals. Delivery methods include one-on-one counseling, fact sheets, newsletters, conferences, workshops, Internet programs, and more.

Maryland Cooperative Extension educators developed over 600 programs, which were held in 23 counties, Baltimore City, three regions in Maryland, statewide, multi-state, and national. Topics covered were basic money management, credit use, insurance coverage, estate and retirement planning, savings and investments. These programs reached over 10,000 people.

Examples of educational programs include the following:

Project 5.4.1. Maryland Cooperative Extension Personal Finance Seminar for Professionals.

a. Project Statement. Financial educators and counselors have an increasing need to keep current with an ever- changing body of knowledge. Since 1989, Maryland has offered an annual financial education seminar to meet the needs of educators in the employment of the financial industry, Land Grant Universities and the military. Ten hours of general sessions were presented by nationally recognized authors**.** Fifteen concurrent sessions were held to meet the needs of military personnel as well as the university and industry representatives

b. Impact. Evaluation from the 17-hour seminar attended by 125 participants (85 evaluations returned) indicated that the participants felt presentations were excellent (4.4-4.1 on a 5-point positive Likert Scale). They “learned a great deal” (4.4 to 4.1), and felt it was “very useful in my work” (4.4 to 4.2). Participants rated the seminar at 4.5 in "well worth my time to attend**.**

Participants reported that they counseled or educated in excess of 41,000 clients/families per year. Overall, MCE increased the number of Maryland consumers who enhanced their financial literacy and money management skills, managed credit better and reduced debts, participated in savings plans and increased savings/investments, plan for a secure retirement and later life issues (e.g., estate planning, long-term care). MCE enhanced the capacity of local educators, financial counselors, and human service providers to deliver personal finance education programs to help their clients.

c. Source of Funds: Smith Lever 3b&c and state general funds. This project is self-funded through registration fees.

d. Scope of Impact: National. Participants came from U.S. military, credit unions, housing non-profits, housing management agencies, financial institutions, five State Cooperative Extension/LGU's, and credit counseling non-profits.

Project 5.4.2. Anne Arundel County. Financial Stability

a. Project Statement. Financial Stability. Objectives: Consumers will gain knowledge and strengthen skills in order to improve management of their financial resources and obtain financial stability. Economic stability issues include credit management and basic money management. Forty classes were attended by 1,564 participants in the area of financial stability. A proactive in depth money management program Financially Fit was conducted in partnership with the Employee Assistance program of the National Security Agency. The four part series (8 hours total instruction) was offered 3 times in 2002. Financially Fit was completed by 483 employees.

b. Impact. This four-part curriculum provides a comprehensive money management program and has helped participants identify money management problems before they become unmanageable. Pre-Post tests (N= 451) showed:

- 71% developed a spending plan
- 54% requested a credit report
- 48% increased savings
- 32% completed a net worth statement

Managing Money in Changing Times was developed in response to families experiencing a job loss. Two classes were presented for 190 employees at Northrup Grumman who received lay-off notices. Basic money management was the core of the information presented along with a check- list designed to help families quickly identify financial resources and strategies to cope with decreased income. Class participants identified overuse of consumer credit and lack of savings as the top two areas that were causing financial distress. The following results were reported as compiled from the use of worksheets in this two-hour interactive session:

- 77% of participants completed an emergency spending plan
- 65% identified strategies to reduce expenses
- 88% increased their knowledge of the annual percentage rate of credit
- 76% identified unfavorable credit practices
- 64% planned to obtain a credit report

Power Pay computer analysis was completed for 118 class participants and consumers. This analysis tool allows families to evaluate different options for repaying debt. Each family specifies how much beyond the required minimum they would like to pay towards debt. The program generates a print out that shows the savings that can be realized. The average savings, per family in 2002 that completed the proposed debt repayment schedule was $1,443.

Money Transitions was a program developed to address the money management needs of individuals transitioning to other employment, re-entering the work force, or facing early retirement. This program was presented 8 times for military members, at 2 welfare to work sites and for 1 local employers offering early retirement. Spending plans were used by 11% of the audience prior to the sessions. End of meeting evaluation showed that 86% identified 3 or more ways to maximize their financial resources.

Hard to reach audiences were targeted through a mandatory money management class, Making the Most of Your Money which was offered at a community housing authority office. Residents facing eviction were notified of the class and required to attend in order to postpone eviction. The 37 participants completed a budget simulation activity.

Smart about Money from the Start was a class developed in response to Head Start case workers request for a money management classes for parents. Evening classes for parents and train the trainer sessions for Head Start case workers were presented to a total of 23 attendees. Basic age appropriate money concepts for children were introduced along with corresponding tips for parents.

c. Source of Federal Funds: Smith-Lever3b&c and state extension funds

d. Scope of Impact: County Specific

Project 5.4.3. Caroline County. Financial Counselor Training.

a. Project Statement. 49 families were assisted with financial counseling. 14 developed a monthly spending plan; 12 developed a debt repayment plan; 33 reviewed their credit report. 4 volunteers (2 government agency personnel, 1 volunteer, and 1 mortgage sales person) attended 18 hours of Volunteer Financial Counselor training, passed the written test and received certificates.

b. Impact. On a scale of 1 – 5 with 5 being excellent, 2 rated the training 5 and 2 rated the training 4. At the end of training, the following was asked: 'What areas of money management do you feel confident about?'

	Before Class	After Class
Establishing goals	2	4
Setting up spending plan	2	4
Organizing records	3	2
Analyzing debt situation	2	4
Reviewing insurance coverage	2	1
Reviewing income tax forms	1	1
Encouraging savings	1	4
Establishing need for an updated will	2	3

At the end of a basic budgeting and saving for home buying class, 7 out of 7 customers wrote financial goals.

c. Source of Funds: Smith-Lever 3b&c and state general funds.

d. Scope of Impact: County Specific

5.5. Develop and accept individual, parental, home, financial, and/or community responsibility through work, family and community involvement

(Key Theme – Child Care/Dependent Care, Parenting)

Maryland Cooperative Extension educators developed over 300 educational programs, which were held in 23 counties, Baltimore City, three regions in Maryland, statewide, multi-state, and national. Topics covered were care giving, understanding children and their development, modeling appropriate behavior, nurturing family members, advocating for families. These programs reached over 20,000 people.

Examples of educational programs include the following:

Project 5.5.1. Maryland Cooperative Extension Child Care Provider Training

a. Project Statement. Regulated childcare providers in Maryland are required to have continuing education hours in health and safety and child development and curriculum to maintain their licensure. These hours are reviewed every year and must come from approved trainers in the state. Maryland Cooperative Extension has been an approved trainer since 1994. Family childcare providers and child care center directors and teaching staff is the primary audience for MCE's training. Others who attend include parents; Head Start and public school teachers and unregulated child care providers. Training covers topics in child development, curriculum, health and safety, business management and topics of professional

development (such as stress management). Topics are offered at beginning, intermediate or advanced levels of professional development, depending on the needs of the audience. MCE frequently partners with other child care/early childhood groups to conduct training, thereby broadening our reach and enhancing the quality of our programs.

b. Impact. Each year MCE trains approximately 2,000 regulated providers in the state with continuing education that can be used to maintain state registrations or licenses for child care. FTE commitment to our training varies, but an Extension educator in each county offers, on average, 3 hours per month. Evaluation data from 6 hour continuing training conferences attended by 30 to 150 participants reveals that participants feel more competent in their work with children and feel more committed to the profession of childcare. In addition, participants report more contacts with others in their field, and a greater sense of support for their work from other professionals and from parents. The training is consistently rated as being high quality and highly popular with provider audiences. MCE professionals sit on advisory councils of local Child Care Resource and Referral Centers.

c. Source of Funds: Smith Lever 3b&c, and state general funds.

d. Scope of Impact – State of Maryland. Collaborators include Child Care Administration, Maryland Committee for Children, and local childcare resource and referral and professional child care associations.

Project 5.5.2 Calvert County. Welfare to Work Program.

a. Project Statement. The welfare to work grant started in 1997 and now includes Life Skills classes and mentoring program. During FY2002, almost 300 hours of Life Skill classes were taught. 30 clients started the 54-hour course, which was offered every 2 months.

b. Impact. 15 (45%) completed all requirements for the course. The 18 who did not complete the course either started a paid job, left because of health problems, imprisonment, etc. All participants took a pretest and identical posttest comprised of 40 questions. For the 10 students who took both tests, the point difference in the means was 15 representing a 75% increase in knowledge. Although follow-up info. from W2W participants is difficult to obtain due to frequent address changes, follow-up information was obtained through the mentor program. As a result of taking this course, most (80%) felt more confident about managing work, family and home, all used one or more of the time management tools (appt. book, home filing system, etc.), all made progress toward achieving the personal/financial goals set in class.

c. Source of Federal Funds: Smith-Lever 3b&c and state general funds.

d. Scope of Impact: County Specific

5.6 Enhance the attractiveness of Maryland youth to potential employers to enable youth to be productive, contributing members of a global society; Increase the ability of Maryland youth to have caring relationships with family members, peers, and others in their communities; Increase the abilities of Maryland youth to be competent youth leaders with a strong commitment to civic and social responsibility; Strengthen Maryland youth's understanding of the importance of good health and safe and healthy lifestyles.

Maryland Cooperative Extension educators developed over 400 programs that were held in all 23 counties, Baltimore City, all three regions in Maryland, statewide, multi-state, and national. Topics covered were enabling youth to be productive, contributing members of a global society; have caring relationships with family members, peers and others; competent youth leaders with a strong commitment to civic and social responsibility; and understanding of the importance of good health and safe and healthy lifestyles. These programs reached over 100,000 people.

Examples of educational programs include the following:

(Key Themes – Children, Youth, and Families at Risk)

Project 5.6.1 Reaching Diverse Audiences: Montgomery County 4-H Helps People with Autism.

a. Project Statement. The Maryland Public Law 94-142 Mainstream program has increased the awareness of disabled youth needs for the 4-H program. This 4-H horticulture project engages students and staff from Maryland Community Service for Autistic Adults and Children (CSAAC), the Montgomery County 4-H educator and the extension master gardeners. The CSAAC serves children and adolescents with autism between the ages of 9 to 21 years of age. The extension educator and the master gardeners designed the project to correspond with the students' abilities and personal needs. The 4-H office, the master gardeners and the extension horticulture unit provide gardening tools and seeds for the project. The students make weekly visits to the garden to weed, water and harvest the vegetables.

b. Impact. The 4-H program increased its awareness of autism and need for other programs for the mentally and physically challenged. For four years, twenty students with autism and one teacher participated in the horticulture gardening program. Severely mentally challenged youth:

- Learned skills in growing, cultivating and harvesting a garden.
- Increased skills in preparing nutritional meals at the site and home.
- Exhibited vegetables, flowers and crafts at the county fair.

- Increased their self-esteem by receiving cash awards and ribbons at the fair.
- Used and improved fine motor skills with 4-H projects.

c. Source of Funds: Smith-Lever 3b&c, and state general funds

d. Scope of Impact: County Specific

5.7 Youth Development

(Key Themes –Character/Ethics Education)

Project 5.7.1. Carroll County 4-H Kids On The Block Program Disability Awareness Program.

a. Project Statement. Adoption of Maryland's Public Law 94-142 (mainstreaming) has increased the number of disabled youth in the 4-H program and the local school system. The Carroll County 4-H Program and the Carroll County School System have cooperated to provide the Kids on the Block Disability Awareness Puppeteering Program. This disability awareness program increases knowledge and understanding of how youth can relate to disabled individuals. The program consists of 18 teens that serve as puppeteers and perform skits on various disabilities. What has been done? Performances were scheduled with all 21 second and fourth grades in county elementary schools in 2002. A packet of hands-on activities was distributed to the classes. The activities were designed to allow students to experience what life is like for individuals with a disability. For example, students were blindfolded and given a cane to navigate around the room as a blind person would.

b. Impact. In 2002, the Kids on the Block Program reached approximately 3,400 students. This program has had effects on the students and the puppeteers that participate in the program. Pre- and post-test surveys indicated that 94 percent of the students viewing the program increased their knowledge of disability awareness. The Carroll County Kids on the Block Program reaches many youth and provides them with information and ideas that they can continue to use in their day-to-day life and interaction with the disabled.

c. Source of Federal Funds: Smith-Lever 3b&c and state general funds

d. Scope of Impact: County Specific

Project 5.7.2 Baltimore City. Feeding the Hungary.

a. Project Statement.. A large amount of food is being wasted. Statistics indicate that over 120 million tons of food is wasted annually in this country.

According to the Maryland Food Committee, the growing number of needy individuals is overwhelming food providers and soup kitchens. Many are turned away each day because there is not enough food to give. More and more children (at least 40,000 in Baltimore alone) go to bed hungry each night.

Working in conjunction with the Mid-Atlantic Area Gleaning Network, the Center for Poverty Solutions, Heritage United Church of Christ, and the Unity United Methodist Church, Baltimore City 4-H'ers, parents and volunteers are gleaning and distributing fresh produce to those in need of food. Additionally, 4-H'ers are baking, on a monthly basis; 6-three pound Macaroni and Cheese Casseroles for Our Daily Bread Soup Kitchen. Gleaning is done one Saturday morning per month. Produce is picked for Baltimore and/or Washington D.C. Food Banks. The 4-H'ers also pick produce to bring back and distribute directly to persons in need in the city.

b. Impact. Baltimore City residents are benefiting from the fresh produce that the 4-Her's have gleaned and the casseroles they prepare. There efforts have resulted in two years of grant funds from Kraft Foods, Inc. for $ 1250 annually..

c. Source of Federal Funds: Smith-Lever 3B&C and state general funds; grant funds.

d. Scope of Impact: City Specific

5.8 Youth Development

(Key Themes –Jobs/Employment, Workforce Preparation)

Project 5.8.1 Somerset County. PowerUP Lab.

a. Project Statement. PowerUP Lab The PowerUp Lab was organized after receiving a grant for the purpose of assisting under-served youth to obtain the skills, experiences and resources required to succeed in the digital age. It's activities are aimed at fulfilling the five promises identified by, "America's Promise-The Alliance for Youth" as being key to building character and competence of our young people; and include caring adults; safe places; marketable skills; and opportunities to serve.

The project in Somerset County has the following goals: to utilize exisiting Extension programs to provide better access to community members through the internet, to increase youth participation in 4-H programs building e-commerce sites for individuals to market local products, teaching the elderly computer skills to build and maintain web sites and domanins, and working with the agriculture and waterman communities to brige the digital divide. This grant has allowed the Crisfield Community to have the opportunity to enrich their population through

technology by utilizing youth and adult partnerships to enhance educational and business opportunities.

The project consists of many facets that included securing a location for the facility housed is the Woodrow Wilson Community Center; this organization serves African American, White and Hispanic youth population from primarily single parent families that have limited resources. By working cooperatively with the UMCP IT unit, an additional grant was secured from the National Science Foundation for a taychon digital satellite, which allows for connectivity speed of 256K. Funding was also secured from MCE for a program assistant to run the lab. Finally, a donation was secured to purchase tables, chairs, and other office furniture.

b. Impact. Currently the lab is serving One hundred and Fifty youth ages 2-17, with a racial breakdown of 75% African American, 15% White, and 10% Hispanic. These youth include drop-ins, 4-H club members and pre-school children who attend the daycare center. It also provides outreach to twenty-three elderly adults.

c. Source of Federal Funds: Smith-Lever 3 b & c; PowerUp grant; NSF grant, County donation; and state general funds.

d. Scope of Impact: County Specific

Project 5.8.2 Maryland 4-H Mini-Societies.

a. Project Statement. The Maryland 4-H Mini-Society is a 4-H outreach to under-served youth. The programs are in three counties in the Baltimore-Washington corridor and Baltimore City, the major urban areas of Maryland. Mini-Society taps a large diverse population to include African-Americans, El Salvadorans, Koreans, Chinese, Japanese and others of Hispanic and Asian heritage creating awareness that entrepreneurship is a viable option of employment. This experiential education program engages the target audience in creating a society to include currency, government, flag and civil servant jobs that they apply, interview and conduct. One hundred two youth ages eight to thirteen participated in four mini-societies in Montgomery County and Baltimore City.

b. Impact. Participants expressed satisfaction in the program in these ways, "It was fun especially when running the business." "In 4-H Mini-Society you have fun and at the same time you learn." "It was the best time learning." One community partner in a subsidized housing development said, “This is a great program. The skills that they learned will be very useful. We need more programs like this.” Extension Educators are ecstatic about the enthusiasm and interest the participants displayed in Mini-Society. Parents felt the program provided insight about the workings of economics and decisions required in society. Youth are

players in the educational process of Mini-Society creating many teachable moments. They formed corporations, advertisements, market surveys, and dealt with issues like, scarcity, competition, supply and demand, and the legality of contracts. They learned and used new terms in town meetings, trials and other businesses. Youth increased their skills in math, writing, spelling and vocabulary in the program. Leadership skills and team effort were greatly increased as the youth developed products and services to sell.

c. Source of Federal Funds: Smith-Lever 3b&c and state general funds; Ewing Marion Kauffman Foundation Grant for $20,125.

d. Scope of Impact –Multi-county Specific. Collaborators included: Anne Arundel County: Hot Spots (Governor's Program on Crime Prevention) Baltimore City: Edgecombe Circle Elementary School and the 4-H Residential Camp Howard County: Community Homes Housing Development and Howard Co Board of Education Montgomery County: Rock Creek Terrace Housing Development and Parkland Middle School

Project 5.8.3. Prince Georges County. **4-H After School Summer and Year round Program**

a. Project Statement. The University of Maryland Cooperative Extension, Prince George's County 4-H Youth Development Program is the recipient of a grant award totaling $190,000.00 awarded by the Prince George's County Department of Families Services, Division for Children, Youth and Families. The 4-H Youth Development Program proposed to provide structured Summer and Fall after-school enrichment opportunities to 337 students, ages 8 – 12, residing in the Landover, Glenarden, Kentland, Capitol Heights and Seat Pleasant communities. Both summer and fall Enrichment Program is entitled: "Believing In Yourself, Yes I Can Read". The project goals include: to increase and improve character development and character building skills; to enhance and improve civic pride, involvement, education and leadership skills; and to improve academic skills, such as reading, reading comprehension, math and writing.

b. Impact. The Summer II Program consists of eight weeks of programming, June- August. Program structure consists of five days of programs per week Monday –Friday. Three "hot spot" communities were identified with the Landover corridor. Eighty-five youth were contracted in the program scope, however the program planning and implementation was so well received that 115 youth were enrolled. A twenty-four week fall program is funded to enroll 337 minority low-income youth September- December. Additional funding has been obtained to continue through the next program year.

c. Source of Federal Funds: Smith-Lever 3b&c and state general funds; county grant of $190,000.

d. Scope of Impact: County Specific

Part A. Planned Programs (continued)

Goal 6. Agriculture Communications, Enhancing Customer Service/Satisfaction Information Technologies

All of these goals and themes are being addresses by the Communications and Information Technology (CIT) unit. Which has recently been restructured and realigned to better serve the information and technology needs of the entire College, including instruction, Extension, research and international programs. The new structure includes 4 major areas, each headed by a unit coordinator reporting directly to the Associate Dean for CIT: media services, marketing/media relations, information technology, and distance learning. CIT is not an academic department, rather a service and program unit working directly with campus and field faculty to further the outreach mission of the College.

Within CIT, there is an increased awareness of teamwork, mutual respect, open communication and respect for cultural differences. Currently, 23% of the staff is African American and 52% female. Strategies used to achieve a heightened awareness of mutual respect, teamwork, and open communications have included:

- Statewide focus group meetings and listening sessions
- Full staff retreat to discuss focus group findings and explore group strategies
- Individual team meetings
- Regular staff meetings held at two locations, both campus and Riverdale, the site our printing facilities
- Open door policy encouraging casual drop ins for information sharing and problem solving
- On-line anonymous suggestion box
- Weekly coordinators meetings in an informal setting for information sharing on projects and problem solving.

A major goal of CIT is to continue to encourage open communications, trust and mutual respect among staff and between staff and faculty who seek our services. Quality media products are derived from creative and motivated minds. To achieve true success, CIT must strive for an organization climate where each member is valued and rewarded not only for quality work but for teamwork and mutual respect as well.

Major initiatives for CIT, include:

- Implementation of new college web site for seamless entry and access to information, template designs for each county
- Migration from reliance on print media to web-based media products and distribution
- Increased faculty development for field faculty in information technology and distance learning applications
- Increased emphasis on marketing Extension to new and underserved audiences
- Implementation of satellite based Internet programs (funded by NSF)

- Three sites have been established.
- Upgrading bandwidth and technology resources at each regional research and education center.
- Implementing videoconferencing projects using IP (H.323)

Part A. Planned Programs (continued)

Goal 7. Multicultural and Diversity Issues

MCE is using diversity management principles and practices to implement an initiative aligned with the AGNR and UMCP Diversity Initiatives and Strategic Plans.
The plan's purposes are 1) attracting and retaining a more diverse work force, 2) creating a positively charged work climate, and 3) attracting new audiences to extension programs.

Accomplishments/ Key Outcomes

In its startup year, the initiative plan was written and the following outcomes were achieved in MCE:

- Established State Search Committee and trained them to recognize intercultural qualifications of prospective job candidates, resulting in positive screening for diverse candidates
- Developed informal internal EEO/AA resolution process for MCE and fielded a trained corps of twenty-four faculty EEO/AA Advisors.
- Streamlined Internal Compliance Review Process with updated data collection through MCERS Reporting System.
- Developed and implemented new Program Accessibility and Media Statement policies, including a "Making Programs Accessible" guide furnished to all county offices.

In the current reporting year, the following have been accomplished:

1. Implemented diversity/audience expansion training for MCE at Annual Conference (3-01).
2. Integrated diversity-related outcomes and activities into individual and county plans of work.
3. Worked with region and county directors to establish meaningful diversity-related goals including employment and programs, establish baseline measures, and evaluate progress.

Part B. Stakeholder Input Process

The College of Agriculture and Natural Resources following the lead of the University of Maryland began the process of developing a strategic plan for the college including both Maryland Cooperative Extension and the Maryland Agricultural Experiment Station. The process was completed and the plan is now available to faculty, staff, students and stakeholders. The information from the Key Informant process described below was used as an input in the plan development process. The strategic plans are available as follows:

For the University: **http://www.inform.umd.edu/provost/Strategic_Planning/Plan.html**

For the College: **http://www.agnr.umd.edu/Dean/index.cfm?ID=106**

Administrative Committees

The Dean's Leadership Council met during the reporting period and provided important feedback from the client groups they represent. In addition the Dean and Director is able to seek specific input from this group as need arises.

Extension Advisory Councils

County Extension Advisory Councils (EAC) meet on a regular basis in most of Maryland's counties and Baltimore City. The EAC's provide insight into and support for the local extension programming. The Regional Extension Directors meet with the EAC's for the counties in each region on a regular basis. In addition the Assistant Directors/Program Leaders and Associate Director occasionally meet with these EACs. Maryland Extension Advisory Council (MEAC) did not meet during the reporting period. The MEAC has been found to be less than efficient in providing desired input into the programs of the state. Reorganization of the MEAC is underway with a goal of reviving meetings in fall of 2003.

Outcomes 2002

The planning document, Outcomes 2002: A Framework for Our Future, drafted in 1997 continues to serve as a guide for extension programming in Maryland.

MCE Planning Process

MCE began a strategic planning process in the fall of 2002. This process is expected to result in a revision of the Outcomes 2002 document. The new document is currently being called Outcomes 2008.

Key Informant Process

A Key Informant Survey was designed to acquire input from stakeholders. The goal was to hear from Maryland residents who are not part of the usual clientele of Maryland Cooperative Extension and the Agricultural Experiment Station. In the fall of 1999, two questionnaires (community and food systems) were developed and pilot-tested with the Maryland Extension Advisory Council. During the winter, three counties pilot-tested the process and questionnaire. From April until October, MCE personnel collected data from over 200 persons who represented selected sectors of the community and food system. All counties and Baltimore City were represented. It is expected that in the coming year, the results will be shared within the College and with community groups, local and state officials, and other interested groups. MCE will use the information as it continues the planning process for its next five-year plan.

Customer Questionnaire

No customer questionnaires were used during the reporting period.

User Input Through WWW

The WWW was not used for user input during the reporting period.

Part C. Program Review Process

Merit Review Process
Maryland Cooperative Extension like most other Cooperative Extension System institutions has not historically developed a wide-ranging merit review process in the past. The Plan of Work is an articulation of MCE's approach to Merit Review.

Local Program Reviews
Each MCE Extension Educator is required to develop or update and Individual Extension Plan (IEP also called a Job Description in some MCE documents) each year. These IEP's are updated annually and review internally by Region Extension Directors and State Program Leaders for 4-H Youth Development; Family and Consumer Sciences; and Agriculture and Natural Resources. IEP are shared with the Educator's County/City Extension Advisory Council for merit review and comment. The EAC's are widely representative of the clientele of the county or Baltimore City. ***This update of IEPs continues as described for the current reporting period.***

Each county has developed (and annually updates) a unit plan of work (UPOW). This UPOW is developed and updated with the local Extension Advisory Council. All academic departments with MCE Specialist faculty also develop similar unit plans of work. The MCE State Program leaders and administration review these plans to determine the level of conformity with the County/City UPOWs. These will be available for review on the MCE internal web site. ***This effort continues but on an irregular basis. Efforts will be made to renew this process in the coming year.***

State Program Reviews
Ideas and issues arising from local and departmental UPOWs are developed into a state plan of work (SPOW). The State Plan of Work takes on two separate forms; the Joint Extension/ Research Plan of Work as submitted to the US Department of Agriculture and a local document (currently identified at Outcomes 2002). The SPOW is sent to select 1862 and 1890 extension administrators for merit review. The Northeast Region's Extension Directors have agreed to participate in a shared review of State Plans of Work. ***Review efforts have not been completed as of this reporting period.***

MCE will ask selective individuals to provide a review of the Joint Extension/Research Plan of Work to establish their evaluation of the merit of the Plan. Selected individuals will include Cooperative Extension program leaders in other states, an 1890 administrator from another state and selected clientele members in the state. The merit review process will focus on the three primary programming areas of MCE; Agriculture and Natural Resources, Family and Consumer Sciences and 4-H Youth Development. ***This review has been postponed.***

Comprehensive Program Reviews
MCE will conduct a comprehensive and detailed program review of each of the program areas listed above at least every 4 to 6 years. An outside review panel selected specifically for the purpose of the review will conduct these reviews. This panel will seek input from local and state stakeholders as well as well faculty as they assess the overall program in the selected area. The

first such review occurred in MCE in the fall of 1996 when a detailed review of the 4-H Youth Development program was conducted. This review, conducted by a panel of 4-H Youth Development professionals from other states, resulted in a review document that is currently being used to guide major changes in the program directions of the program. A 4-H Review Summary is provided as a part of this Plan of Work. ***During the reporting period a strategic plan was completed for the 4-H Youth Development programming area.***

MCE will initiate similar program reviews in Agriculture and Natural Resources and Family and Consumer Sciences programming areas over the next five years. These reviews while costly provide considerable guidance to the administration on formulating programming responses to the plan of work. ***No action has been taken on these reviews as of this reporting period.***

Peer Review Process
Peer Review has long been a part of the Maryland Agricultural Experiment Station's approach to funding research as required under the Hatch Act. This process will be continued on all specific projects. ***All aspects of this review process continue during the reporting period. Additional efforts are underway to more completely define the efforts of the Northeast region as defined below.***

Hatch Projects.
Peers in compliance with the guidelines of USDA review all state research projects funded by federal formula funds externally.

Regional Research Projects.
A peer committee in compliance with the guidelines of USDA reviews all regional research projects funded by federal formula funds.

Northeast Research, Extension and Academic Programs.
A peer committee in compliance with the guidelines of USDA reviews all NREAP and related projects funded by federal formula funds.

MAES/MCE Competitive Grants.
All projects funded through the MAES/MCE Competitive Grants program are reviewed in accordance with the federal guidelines for project review by a panel of scientist from UMCP, UMES and other research institutions located in Mid-Atlantic region including USDA-BARC, Johns Hopkins University, University of Delaware and Virginia Polytechnic Institute and State University.

In addition, this specific Plan of Work will be sent to panel of agricultural scientist to assess the proposed research plans.

Several units of the College have undergone external review processes that include Extension and Research efforts of the unit. The Department of Biological Resources Engineering was reviewed for accreditation in the fall of 1999. The Department of Agricultural and Resource Economics was reviewed in 2001 and the Department of Veterinary Medicine was reviewed in 2000. The Landscape Architecture program of the Department of Natural Resources Sciences and Landscape Architecture was evaluated and approved for accreditation. The Department of Nutrition and Food Science has established an accredited dietetics program a few years earlier while recently being approved by the American Dietetics Association to hold and offer an internship program. This program has yet to be accredited.

Part D. Evaluation of the Success of Multi and Joint Activities

Substantial cooperation exists between research and extension in Maryland's two land-grant institutions. This cooperation starts with the administrative level linkages and includes joint appointments and a competitive grants program.

UMCP Administration. This cooperation is directed by the administration of Maryland Cooperative Extension and the Maryland Agricultural Experiment Station which are managed by Dr. Thomas A. Fretz, Dean of the College of Agriculture and Natural Resources, Director of Maryland Cooperative Extension and Director of the Maryland Agricultural Experiment Station, and his designated Associate Directors. They form a single management team of agriculture research, extension and education at the University of Maryland, College Park.

UMES Administration. The UMCP administrative team and the agricultural extension and research administrative team of the University of Maryland Eastern Shore work closely in developing programs for Maryland. Dr. Henry Brooks is the Administrator of 1890 Extension Programs at UMES where extension is a campus wide effort. Dr. Henry Brooks reports directly to the UMES President. He is also a part of the MCE administrative team. Dr. Carolyn Brooks is the Dean of the School of Agricultural and Natural Sciences at UMES. She also works closely with MCP administrative team to bring closer ties to MAES.

Joint Appointments. MCE and MAES jointly fund a number of UMCP academic department faculty members. These joint appointments provide for integrated approaches to applied research and extension. Most State Specialists (all faculty members in academic departments) with MCE appointments have at least a partial appointment in MAES. Scientist/Specialists with such appointments are in a position to assess the needs of agricultural and related clientele through personal contacts or through MCE field faculty (Extension Educators). They can with these assessments design both applied research approaches and extension education programs to meet the identified needs. The strength of joint appointments in academic departments is the synergy of work relationships with research scientist working on more basic research needs.

Competitive Grants Program. MAES provides primary funding for and manages a competitive grants program for agricultural and natural resources research scientists in Maryland. Funding is open to any University of Maryland System institution. The competitive grants program is jointly managed by UMES and UMCP. The program encourages cooperative research/extension submission. Faculty members with primarily MCE appointments have been major recipients of funding through these grant efforts. Each year a set of funding priorities is established which seek to address priority needs in the state. Field faculty are encouraged to participate in the program and often collaborate with research scientists and extension specialists to request funding.

The efforts identified above continue to provide for effective collaboration among institutions and disciplines --- research and extension --- in Maryland. Collaborations among campus and field faculty are increasing, as are multi-disciplinary approaches to problems solving research. This is evident in some of the Planned Activity reports in Part A of this report. Critical needs are being met using "multi" approaches in the area of land use, animal waste management and farm profitability. Additionally, MCE has increased its research base for programs in Family, Youth and Communities by placing MCE funded positions in primarily research and instruction based departments of Nutrition and Food Sciences (in AGNR) and Family Studies (College of Health and Human Performance). These efforts closely link research efforts (not all funded by MAES) with the needs of communities in the state.

Multi-state programming efforts are also strong in the Northeast region. Maryland is a participant in these efforts. This is especially true in agricultural Extension programs. Maryland and Delaware continue to seek ways of sharing resources across boundaries. Efforts have begun with Virginia to seek ways of sharing programming resources, where appropriate, more effectively between the states.

Part E. Multi-state Extension Activities

Multi-State Collaboration
Maryland's two Land-grant institutions have sought to collaborate with other states in providing the highest of quality research and extension education programs possible. These efforts are essential to efficient use of resources and in establishing sound research methodology. Maryland has been a participant in the Northeast Regional Research program for a number of years. Joint Research programs have been developed using the regional research approach. These projects are well established in the region.

- Northeastern Groups
  - NorthEast Research Association (NERA)
  - NorthEast Extension Directors (NEED)
- Northeast Region Joint Research-Extension Plan
- Regional Projects
  - NorthEast Research Extension Project (NEREP)
  - NorthEast Research Project (NERP)
  - NorthEast Research Extension and Academic Projects (NEREAP)
- 1890 Region
  Association of Research Directors: ARD was formed and incorporated in 1972 to coordinate most of the food and agricultural research activities among the 1890 Land-grant Universities, USDA, and other colleges and universities. Through this body, regional research projects are formulated whereby several interested institutions participate. Over the years three such efforts have occurred and supported by several 1890 Land-Grant universities on high priority issues.
- 1890 Extension Directors'

Multi-state extension efforts are extensive for MCE. As a small state with many bordering states and counties, efforts are often targeted to clients in Delaware, New Jersey, Pennsylvania, and West Virginia as well as Maryland. These programs (usually in the agricultural sciences) are often done in cooperation with extension educators in the adjoining states. Recent efforts include workshops on precision agriculture, computer use, risk management, greenhouse IPM, nursery nutrient management, vegetable production and family life. In addition, biosecurity efforts in the poultry industry extend throughout the Delmarva Peninsula states of Maryland, Delaware and Virginia. While evaluation is still underway, these programs appear to have met client expectations in many areas of concern.

These efforts decrease the need for duplicative faculty (especially Specialists) in the various states resulting in greater efficiency of program delivery. In some programming areas, the clients from several states may be required to develop a critical mass for program delivery.

Part F. Integrated Research and Extension Activities

Integration of Research and Extension efforts are described to some extent in a previous section. MCE and MAES programs are both managed by administrators in the College of Agriculture and Natural Resources housed only a few feet apart. These arrangements, along with the joint funding efforts described above, are paramount in developing a close and effective integration of research and extension. Not all aspects of Extension or Research have a counterpart in the other unit. For example, historically MAES has provided little funding in the areas of human sciences resulting in a low level of research output in this critical area. Research results were sought from other institutions to assist the Extension areas. MAES recently funded an important applied research effort in human sciences that will be carried out by in part by Extension specialist in MCE.

The effective utilization of joint appointments provides much of the integration of Research and Extension. Extension Specialists at the campus level are rarely hired without a joint appointment in either research or academic programs. Most new hires are well versed in research methodologies and expect to collaborate with other researchers in developing both Extension and Research programs. This is an effective integration process.

Appendix: Table of Resource Commitments by Planning Goal

The following three pages contain the required FORM CSREES-REPT (2/00) in facsimile form for:

Multi-state Extension Activities
Integrated Activities (Hatch Act Funds)
Integrated Activities (Smith-Lever Act Funds)

The forms are submitted in electronic form and are not signed.

U. S. Department of Agriculture
Cooperative State Research, Education and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Multi-state Extension Activities and Integrated Activities

Institutions University of Maryland
University of Maryland Eastern Shore
State Maryland

Check one: _x_ Multi-state Extension Activities
___ Integrated Activities (Hatch Act Funds)
___ Integrated Activities (Smith-Lever Act Funds)

	Actual Expenditures				
Title of Planned Program/Activity	FY2000	FY2001	FY2002	FY2003	FY2004
Goal 1 - To Achieve an Agricultural production system that is highly competitive in the global economy	$295,994	$288,928	$290,209		
Goal 2 - A safe, secure food and fiber system	$35,307	$34,674	$38,676		
Goal 3 - A healthy, well-nourished population	$116,272	$117,051	$129,388		
Goal 4 - Achieve greater harmony (balance) between agriculture and the environment	$213,177	$209,115	$210,181		
Goal 5 - Enhanced economic opportunity and quality of life for Americans	$110,974	$113,292	$113,528		
Total	$771,724	$763,060	$781,982		

_____ April 1, 2003_
Director Date

Form CSREES-REPT (2/00) Facsimile

U. S. Department of Agriculture
Cooperative State Research, Education and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Multi-state Extension Activities and Integrated Activities

Institutions University of Maryland
University of Maryland Eastern Shore
State Maryland

Check one: ___ Multi-state Extension Activities
_x_ Integrated Activities (Hatch Act Funds)
___ Integrated Activities (Smith-Lever Act Funds)

	Actual Expenditures				
Title of Planned Program/Activity	FY2000	FY2001	FY2002	FY2003	FY2004
Goal 1 - To Achieve an Agricultural production system that is highly competitive in the global economy	$438,858	$433,593	$412,174		
Goal 2 - A safe, secure food and fiber system	$27,460	$25,588	$23,326		
Goal 3 - A healthy, well-nourished population	$41,190	$38,382	$34,989		
Goal 4 - Achieve greater harmony (balance) between agriculture and the environment	$270,438	$268,683	$227,364		
Goal 5 - Enhanced economic opportunity and quality of life for Americans	$2,296	$2,296	$2,411		
Total	$780,242	$768,543	$700,264		

_____ Director

April 1, 2003 Date

Form CSREES-REPT (2/00) Facsimile

U. S. Department of Agriculture
Cooperative State Research, Education and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Multi-state Extension Activities and Integrated Activities

Institutions University of Maryland
University of Maryland Eastern Shore
State Maryland

Check one: ___ Multi-state Extension Activities
___ Integrated Activities (Hatch Act Funds)
_x_ Integrated Activities (Smith-Lever Act Funds)

	Actual Expenditures				
Title of Planned Program/Activity	FY2000	FY2001	FY2002	FY2003	FY2004
Goal 1 - To Achieve an Agricultural production system that is highly competitive in the global economy	$470,142	$468,717	$458,711		
Goal 2 - A safe, secure food and fiber system	$27,324	$24,430	$23,680		
Goal 3 - A healthy, well-nourished population	$40,986	$36,645	$35,521		
Goal 4 - Achieve greater harmony (balance) between agriculture and the environment	$226,613	$228,107	$201,381		
Goal 5 - Enhanced economic opportunity and quality of life for Americans	$7,348	$7,715	$7,715		
Total	$772,413	$765,614	$727,008		

_____ Director

April 1, 2003 Date

Form CSREES-REPT (2/00) Facsimile