

**Annual Report of Accomplishments and Results**

**Maryland Joint Extension and Research Report**

**On the**

**Maryland Joint Extension and Research Plan of Work**

**As Submitted July 15, 1999**

For

**Fiscal Year 2003  
Ending September 30, 2003**

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## Summary

This document constitutes the Annual Report of Accomplishments and Results for the fiscal year 2003 (October 1, 2002 to September 30, 2003) 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**

0.0 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 – Converting Dietary Protein into Tissue Gain or Milk in Ruminants

Project 1.1.4 - Using Animal-harvested Forages to Increase Farm Profits

Project 1.1.5 - Vegetable and Fruit Production (New Vineyard Establishment)

Project 1.1.6 - Maryland Quality Wine Alliance

Project 1.1.7 - Managing Pests in Organic Crop Production

Project 1.1.8 - Sheep & Goat Production

Project 1.1.9 – UMES - Characterizing Cowpea Genotypes for Drought Tolerance in the Delmarva Ecosystem

Project 1.1.10 – UMES - Controlling Ineffective *Bradyrhizobium* with Phages to Enhance Nitrogen Fixation in Soybean

Project 1.1.11 - UMES - Cloning a Novel Satiety Factor in Swine and its Effects on Pituitary Hormones

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 - Farm Profitability & Marketing

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

Project 1.3.3 – Production of Alternative Crops with Value-added Enhancements

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

## **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.

Project 2.1.3 – EFNEP County Example

Project 2.1.4 – FSNEP Program Helps Maryland Residents at Risk for Insufficient Food to Meet Nutrient Needs

Project 2.1.5 – FSNEP County Example

2.2 Improve consumers’ knowledge and practice of safe food

Project 2.2.1 – UMES - Development of predictive models for the survival of *Campylobacter jejuni* on chicken as a function of temperature

Project 2.2.2 - Neighborhood GRIME Watch

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

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. Food Safety Trainings

Project 2.3.2 – Feeding the Community Safely and Feeding the Children Safely

Project 2.3.3 - Seafood Safety for Industry

Project 2.3.4 – Real-time Response Biosensor for *E. coli*

Project 2.3.5 – Surveillance Program to Monitor Antimicrobial Resistance in Foodborne Pathogens.

## **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 – Diabetes Education for Limited Resource and Minority Communities

Project 3.1.2 – Prevention of Diabetes and its Complications by Improving Nutrition and Health practices

Project 3.1.3 – Multi-County. Nutrition and Health: Decrease the Risk of Chronic Disease through Nutrition and Healthy Lifestyles

Project 3.1.4 - Folic Acid Education.

Project 3.1.5 – Nutrition for Good Health

Project 3.1.6 – Summer Nutrition in Baltimore City

## **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.

Project 4.1.2 – Low Phytate Soybeans Increases Poultry Nutrition and Reduces Manure Phosphorus

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 – Deep Row Biosolid Application to Grow Trees

Project 4.2.3 - Maryland Residents Receive 'Homework' Assistance

Project 4.2.4 - MD Master Gardeners Program (Volunteers Help Home Gardeners Reduce Pesticide Use & Improve Water Quality)

Project 4.2.5 – Greenhouse Integrated Pest Management

Project 4.2.6 – Home & Garden Information Center

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 from soil.

Project 4.4.4 – UMES - Development of national and international standards and performance specifications for protective clothing materials

Project 4.4.5 - UMES - Reduction in Animal Waste Pollution through the Use of Enzymes to improve phosphorus digestion

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

Project 4.6.2 – 4-H Wildlife Food Plots

Project 4.6.3 - UMES -Impact of Population Reduction on Movement, Health, and Reproductive Behavior in Nutria

## **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 – Youth Civic Engagement

Project 5.3.4 – Youth-Adult Partnerships

### 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 – St. Mary’s County Child Care Provider Development

### 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

Project 5.6.2 – Kid’s Taking Charge – Youth in Self-Care

### 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 - 4-H After School Initiative

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

Project 6.1.1 - UMES - Development of a Distance Education Classroom

Project 6.1.2 - UMES - Enhancing Instruction through Web-Assisted Courses

## **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 12,200 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 55.8 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 800 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 39,879 people.

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 inter-seeded 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 feed 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 alternative 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.

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

**b. 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

**Project 1.1.3 – Converting Dietary Protein into Tissue Gain or Milk in Ruminants**

**a. Project Statement.** Although ruminants convert human inedible plant material into high quality human edible food, they are very poor at converting dietary protein and energy into tissue gain or milk. This is a particular problem in ruminants fed forages and grasses where production is low and the efficiency of depositing dietary nitrogen into animal products may reach only 15%.

**b. Impacts:** The overall goal of this project is to investigate two aspects of ruminant metabolism that may contribute to nitrogen inefficiency: 1) amino acid and energy metabolism by the gut tissues and 2) urea recycling. The ability to identify the critical control points and regulators of these processes has great potential to improve efficiency and production of ruminants. This research will lend itself to the development of feeding strategies that optimize performance and reduce nutrient wastage in ruminants.

**c. Source of Funding:** Hatch

**d. Scope of Impact:** International

Maryland Cooperative Extension educators developed 545 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 13,650 people.

**Examples of educational programs include the following:**

**Project 1.1.4 - 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, 220 producers participated in 8 walks in Frederick County. Total number of participants for pasture walks is lower than in 2002, but participation per walk has risen from 26.7 to 27.5. An additional 150 producers were reached with research-based information on grazing systems during farmer workshops in Frederick and Howard Counties. During 2003, three dairymen have begun using grazing for a portion of their animals. 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.

**b. Impact.** Based on the five-year average financial data from 27 Maryland farms, of which 10 are grazing operations, graziers have a higher profit per hundred pounds of milk sold (\$4.08 vs. \$2.30), per cow (\$624 vs. \$437), and total dollar profits (\$49,487 vs. \$44,605) compared to confinement operations. 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. Four 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 2003 harvest season.

Fultz, in cooperation with Don Schwartz, Washington County Ag Agent, has continued grass variety trial research at the WMREC. Plots were harvest nine times in 2003. Data from the perennial grass plots of 2000-02 continues to be analyzed.

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

**d. Scope of Impact:** Multi-County Specific

**Project 1.1.5 - Vegetable and Fruit Production (New Vineyard Establishment)**

**a. Project Statement.** New vineyards are established throughout the state in the most efficient and economical manner. Entrepreneurs utilize proper site selection, ground preparation, establishment techniques, and make educated variety choices to get new venture off to efficient start.

**b. Impacts.** Worked with 70+ entrepreneurs at various stages from discussion, planning, establishment, and expansion of new vineyards. Through formal educational programs, personal site evaluations, and conversation, vineyards were planned and established in the most efficient and economical manner, including proper site selection, ground preparation, establishment techniques, and variety choices to get new venture off to efficient start. There was an estimated 35 acres (10+% increase) planted at an average cost of \$7,000 per acre for a total addition of approximately \$250,000 to the Maryland agricultural economy. A greater increase is anticipated for 2004.

**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 1.1.6 – Maryland Quality Wine Alliance**

**a. Project Statement:** Establish a MD Quality Wine Alliance (MDQWA) for the Association of Maryland Wineries to evaluate and set a quality standard designation for commercial MD wines, and set minimum quality standards for all wines produced in the state bearing the designation; include educational component.

**b. Impacts:** Three evaluation sessions were conducted and the 12 commercial wineries were provided with objective analysis and constructive criticism of strengths and weaknesses of wine and how to improve. Two specific event resulted in the saving of 1100 and 825 gallons of wines that were “saved” as a result of observations of flaw and instructions on how to correct. As art of the program, four educational sessions relating to specific timely viticultural and enology topics were conducted – see teaching. Notice was also made by the coordinator that there were fewer problem wines submitted to the Annual Governor’s Cup Commercial Wine Competition in 2003. Fruit quality in the vineyard (extremely challenging vintage due to wet conditions) and wine quality improved as the result of the program. Managing Pests in Organic Crop Production.

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

**d. Scope of Impact:** Multi-state & multi-county.

### **Project 1.1.7 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.

135 farmers and researchers learned about organic cover crop selection and management at a professional development conference, an organic research twilight tour, and a regional sustainable agriculture conference. Extension field faculty serve as a member and vice chairman of the Maryland Organic Certification Advisory Committee (appointed by the Secretary of Agriculture). This group focuses on policy issues regarding organic certification of the 78 certified organic farms (encompassing over 3,500 acres) and retailers in Maryland. Other efforts included teaching 30 Master Gardeners techniques of organic gardening, teaching organic farm certification and management to 32 members of the West Virginia Soil and Water Conservation Society, and serving on the steering committee for PestNet, a weekly grant-funded fruit and vegetable pest report.

**c. Source of Funding:** Hatch Act, Smith-Lever 3(b) & (c), special research grants and State funding, 1890 Extension

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

### **Project 1.1.8 Sheep & Goat Production**

**a. Project Statement:** Producers will implement management practices that maximize their profitability and/or quality of life, while minimizing environmental and animal welfare impacts.

**b. Impacts:** Over 800 people attended sheep and/or goat educational programs, conferences, workshops, and short courses. Twenty producers reduced feed grain costs by 30% or more by mixing their own simple feed rations, as demonstrated in research and educational programs. Fourteen producers borrowed equipment from WMREC to weigh, handle, pregnancy test, or disbud animals. Thirty-eight producers applied for and received USDA disaster, ewe lamb, or wool payments as a result of information provided by extension program. Seventy-seven percent of producers have requested premise ID numbers, in compliance with the National Scrapie Eradication Program (USDA data). The Maryland Small Ruminant Page (web site) had 78,800 hits in 2003. 82 % of respondents (n=35) to an on-line survey indicated that they visited the web site at least several times per month. 100 % of respondents found information on the web site that helped them manage their sheep and/or goat enterprises. 95 % found information on the web site that saved them money or increased their profits. 90% plan to start or expand their sheep/goat flocks.

One-hundred entries were received for the new online Maryland Sheep & Goat Directory. Five (humane) on-farm slaughter posters were requested by producers. Fencing and shelter were set up for sheep/goat research program at WMREC. Approval was granted to start research program in 2003, but goats were not received from UMES due to health problems in source flock.

**c. Source of Funding:** Smith-Lever 3B&C, state general funds & SARE Chapter 3

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

### **Project 1.1.9 - UMES-Characterizing Cowpea Genotypes for Drought Tolerance in the Delmarva Ecosystem**

**a. Project Statement.** This project introduces drought tolerant crops into the farming system of the Delmarva region to protect farmers against complete loss of farm income when corn and soybean fail during drought. The specific objectives are to; 1) characterize cowpea genotypes in terms of suitable planting times and maturity, high and stable yields and its components, nutritional quality and cook ability, resistance to drought, high temperature and insect pests, and develop IPM technology; 2) study the yield potential to enhance cowpea yield by spraying plants with PPFM; 3) develop elite rhizobia strains for effective nodulation and N<sub>2</sub> fixation with cowpea under drought and high temperature stress, and examine the interactions between the rhizobia and cowpea cultivars for high N<sub>2</sub> fixation; and 4) develop extension and training materials on cowpea production, processing and utilization, nutritional values and health. Field trials under rain-out shelter were conducted to study how cowpea plants respond to drought and PPFM imposed at critical growth stages in terms of photosynthesis, leaf water potential, leaf osmotic conductance transpiration efficiency, and growth and yield. Cowpea genotypes were planted at three locations on the Delmarva Peninsula to study their adaptation to the region. Elite rhizobia were developed using mutant technique under high temperature and drought, and superior combinations of rhizobia and cowpea selected for testing at several locations.

**b. Impact.** Anticipated impacts from this project include: (i) stabilized or enhanced production of cowpea in dry years; (ii) farmers assured of an alternative economic income in dry years; (iii) stabilized and/or improved incomes for growers in the Delmarva region; (iv) enhanced sustainable cropping systems through large foliage deposition, application of elite rhizobia, reduced mineral fertilizers for ensuing crops, and PPFM technology; and (v) contribution of trained minority graduates to the workforce locally and internationally.

**c. Source of Federal Funds:** CSREES -Capacity Building

**d. Scope of Impact:** National

### **Project 1.1.10 --Controlling Ineffective *Bradyrhizobium* with Phages to Enhance Nitrogen Fixation in Soybean**

**a. Project Statement.** The goal of this project is to develop a biological control system that eliminates nodulation by undesirable ineffective bradyrhizobia strains and other strains



causing chlorosis in soybean. , The specific objectives were to: 1) identify and select Bradyrhizobium strains that can effectively nodulate and fix nitrogen with soybean under stress conditions. 2) enhance biological nitrogen fixation in soybean using strain-specific bacterial viruses for biological control of ineffective indigenous Bradyrhizobium. 3) select Bradyrhizobium strains that are compatible with and produce effective biological nitrogen fixation with specific soybean cultivars. 4) facilitate technology transfer to UMES students and farmers to enhance agricultural research, development and productivity, and 5) transfer the technology to the private sector (seed and inoculant companies) to enable production of high-quality, stress tolerant inoculants for farmers.

**b. Impact.** The expected outcomes of the project upon completion include: a) new technology to enhance nodulation and nitrogen fixation by soybean through biological control techniques, (b) enhanced soybean yield in the Delmarva region, (c) enhanced cereal crop yield in rotation with soybean, (d) improved socio-economic well being of soybean growers on the Delmarva Region, and (e) enhanced sustainable crop production in the Delmarva region.

**c. Source of Federal Funds:** CSREES -Capacity Building

**d. Scope of Impact:** National and international

#### **Project 1.1.11 - UMES - Cloning a Novel Satiety Factor in Swine and its Effects on Pituitary Hormones**

**a. Project Statement.** Previous research has shown that urocortin may be able to impact appetite and growth hormone secretion without causing a stress response in rats and pigs. Urocortin or related hormones (such as antagonists) have been looked at by other researchers as possible treatment of obesity in humans. It might also be used in modulating growth and carcass quality (fat content) in pigs. A collaborator briefly screened a porcine cDNA library with mouse primers and had no positives. An initial clone identified through RT-PCR in the same laboratory is now thought to possibly be mouse DNA contamination and not pig urocortin. The cloning efforts at UMES were recently re-started with a collaborator in the Department of Natural Sciences. Two UMES doctoral level graduate students previously conducted biotechnology-based research in efforts to get a cDNA sequence for pig urocortin and conducted a preliminary pituitary cell culture experiment with USDA-ARS collaborators (there seemed to be an influence of urocortin on LH and GH though there was not enough data to run statistical analyses). The graduate students have transferred those techniques through training each other, other graduate students (currently) and teaching biotechnology techniques to three undergraduate summer internship students last year and currently to 4 undergraduate students working on continuing the cell culture procedure here at UMES and cloning urocortin.

**b. Impact.** Novel information about this hormone obtained using pigs as a model could impact human health as well as enhance swine production. The new biotechnology equipment and procedures resulting from this research will enhance research capacity through training of faculty, staff and students.

**c. Source of Funds:** CSREES- Capacity Building

#### **d. Scope of Impact: National**

### **1.2 Adopt improved farm business management and marketing strategies**

#### **(Key Themes – Agricultural Profitability, Risk Management)**

Maryland Cooperative Extension educators offered 161 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 1,437 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 2003. 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 624 farmers as part of the Frederick County Small Farm education series since 1996, with 71 participating in 2003. The Dairy Analysis program (1997-2003 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 - Farm Profitability & Marketing**

**a. Project Statement.** Farming is becoming very complex, with pressure from land development, severe weather conditions, regulations and fluxuations in the markets making it difficult for farmers to make a profit. Farmers must become aware of grain marketing techniques to assist them in making a profit.

**b. Impacts.** Twenty-two workshops were planned and conducted in Montgomery County in 2003. Program educational topics included grain basis, futures markets, grain options, price outlook, estimating costs of production, crop insurance and developing a marketing plan. The group develops and carries out a yearly marketing plan for corn, soybeans and wheat under this agents' leadership and guidance. Individual members were strongly encouraged to develop written marketing plans for their own operations. Attendance averaged 13 producers per meeting in 2003 an increase of one over 2002 with a total of 34 different farmers involved in one or more workshops.

The marketing program developed by the group produced average selling prices of \$6.72 per bushel for soybeans. This was significantly above Maryland's average cash price for the marketing year of \$5.88/bushel. The marketing club averaged \$2.70 per bushel on all cash corn sales. This was \$.26 per bushel higher than Maryland's average price of \$2.44 per bushel. The marketing club averaged \$3.16 per bushel on all wheat sales. This was \$.04/bushel above Maryland's average price of \$3.12 per bushel. The sales referenced above were cash transactions. There were also a number and variety of futures market trades to provide risk management protection for the cash transactions.

Most marketing experts agree that farmers who market in the top one-third of the yearly price range have done an excellent job. The yearly price range for corn was \$2.17/bu to \$2.90/bu. The top one third of the price range was \$2.66 to \$2.90/bu. Corn sales were within the top 1/3 and would be considered very successful. The yearly price range for soybeans was \$4.76 to \$8.20/bu. All soybean sales (\$6.72) averaged on the higher end of the middle 1/3 of the yearly price range (\$4.76-\$5.91=low 1/3, \$5.92-\$7.07=middle 1/3, \$7.08-\$8.20=upper 1/3). Although the group did not average in the top 1/3, several cash sales through forward contracts were made at almost the very bottom of the price range. Only creative and aggressive use of the futures market enabled to group to finish with a high average price.

Based on the results of the 2003 marketing year, 100 % planned to develop written marketing plans for their respective operations and felt a written plan was the fundamental building block for successful marketing.

**c. Source of funds:** Smith Lever 3 b & c and MDA state 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 155 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 2,550 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 2003, 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.

**b. Impact.** As a result of this county effort, five other Maryland Counties (Howard, Harford, Cecil, Talbot & St. Mary's) have initiated a similar program, utilizing the core curriculum developed in Frederick County. Also, in 2003, a "Small Farm & Forest Focus Team" was organized and developed two resource lists to enhance scholarship for faculty. Agent/team reviewed 25 submitted materials and made them available for use to other faculty on the MCE Teaching Materials Resource List. The MCE Teachers Bureau List has six faculty listed who will teach in other areas of the state. Eighteen new and revised teaching materials that included scripted PowerPoint slide shows and fact sheets that have been requested in 2003 by Educators in six new states and Baltimore County (total 38 states). Teaching materials are now available by download on the MCE website [www.smallfarmsuccess.info](http://www.smallfarmsuccess.info). A survey of 40 participants from the spring small farm series showed that all will continue their farming venture in 2004; data in Major Program A shows that they gained confidence in their ability to develop a quality of life/successful family farm. Agent, as part of the county Education and Public Relations Committee, assisted with the development and implementation of the Family

Festival @ The Farm, which is an open house on 10 participating farms. The festival attracted over 17,500 visitors from all over the region. The objective of the festival is to promote agri-tourism and the rural quality of life.

**c. Source of Federal Funds:** Smith-Lever 3 B & C, 1890 Extension 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. 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. There were 7 workshops for farmers in Summer 2001, 13 workshops in 2002 and 12 workshops in 2003 and Skip Kauffman and Mark Davis led 3 workshops in 2003. 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 program will be completed in 2004. A web site for farmers was developed:

<http://www.smallfarmsuccess.info/>

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

**d. Scope of Impacts:** Regional-Multi-State

**Examples of research projects include the following:**

### **Project 1.3.3 – Production of Alternative Crops with Value-added Enhancements**

**a. Project Statement.** The Upper Eastern Shore of Maryland, also known as the corn-belt of the Mid- Atlantic, produces corn, soybeans, and wheat as its principal agronomic. Recently, losses in local buying competition coupled with national overproduction of these commodities have reduced the prices received by farmers for these commodities. Data indicate that farmers are currently experiencing negative cash flows with many farmers leaving the industry altogether. If our farmers are going to become profitable, and if land and natural resources are to be preserved through a sustainable agricultural community, it is important for value-added products and new markets to be identified. Ongoing, sophisticated research is required to identify value-added products as well as locate profitable niche markets.

The Maryland Cooperative Extension (MCE) teamed with the Chesapeake Fields Institute (CFI), a 501(c)(3) organization chartered in the year 2000 to address the loss of profitability in traditional agricultural markets throughout farms. By working with local agribusiness, government officials, and community leaders, MCE and CFI have developed a plan that will result in farmers gaining knowledge and skills that will move them toward greater sustainability. The longterm objective of this project is to enable farmers to engage in the production of alternative crops through which value-added enhancements are to be achieved. MCE has assembled a team of researchers at the University of Maryland that possess rich backgrounds in cereal chemistry, plant genetics, crop production, food science, and market feasibility. This diverse set of academic backgrounds ensures a comprehensive approach to developing value-added products and markets and has received major grants to finance the project.

**b. Impacts:** An effective extension mechanism integrating value-added research with field management practice has been developed. What makes this mechanism unique is the fact that farmers are involved in a research-oriented effort that will facilitate adding value to their crops. This mechanism is innovative in that it is the result of major collaborations with area farmers, extension offices, government officials, and academic institutions from all over Maryland. Subsequently, a sustainable/profitable agricultural community will emerge. The research outcomes from this project are expected to contribute to the knowledge of alternative crop production and value-added product development. Ultimately, achievement

of the long-term objective will result in preservation of the land through environmentally sound farming practice that is profitable.

As a measurable outcome, this mechanism is expected to directly lead to improved and more profitable farming practices, as well as enhanced quality of life for Maryland farmers and their rural communities. The diverse research team ensures that a comprehensive approach to developing value-added products/ markets will occur. Additionally, the effective coordination of scholarly research and extension that is the cornerstone of this project is expected to lead directly to improved and profitable farming practices. This mechanism could serve as a model for enhancing quality of life for farmers and their rural communities nationwide.

**c. Source of Funding:** Maryland Center for Agro-Ecology, Inc.

**d. Scope of Impact:** National

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

Maryland Cooperative Extension educators offered 10 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 205 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 its 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 2003, 46 fellows have graduated from the LEAD MD program. WRLI has graduated 50 students as of 2003.

**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 45 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 3,416 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 program emphasizes nutrition, the environment and their inter-relationship with production agriculture. This 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 2,238 students and teachers participated over a 9-day period in 2003. 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' posttest scores improved by over 300 percent from the pretest. The questions were compiled from the three subject matter areas of instruction. Volunteers donated an estimated 1035 hours for this program. According to Volunteer Sector, a coalition of leading non-profits groups, volunteer time was valued at \$16.54 per hour in 2002. Based on these criteria, the total monetary value of the hours donated to Close Encounters would be \$17,118.90.

**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

## **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 410 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 10,250 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.

UMES' commitment to a safe, secure food and fiber system has been literally etched in stone with the construction of the new Food Science and Technology Building that was dedicated on September 12, 2003. This new building provides state-of-the art teaching and research facilities for the doctoral program in food science and technology. This facilities supports work in the following areas: identification of pathogens and spoilage microorganisms; research in food preparation and handling, product testing, and product development; analysis of food composition and research in food safety, food quality, and product shelf life; research on food handling and packaging; animal holding area; and raw product handling facilities including fast-freezing, and many other areas.

## **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 all 23 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 3,000 people. Feeding the Community, Safely! and Feeding the Children, Safely! were presented to over 1,000 participants through 50 educational programs in 14 Maryland counties during 2003.

**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 food-bourne 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**

. **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.

. **Impact:** In 2003 in 8 counties and Baltimore City, twenty-five (25) Extension Nutrition Assistants reached 2,950 limited resource families as well as an additional 10,751 young people in collaboration with schools, after school programs and summer enrichment programs. Demographic, economic and program participation data was collected from all participants.

Nutrition/health/dietary impact data were collected and analyzed for dietary and nutritional quality, and feedback was provided to each participant. 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. Carefully validated cost benefit analysis have established that the EFNEP intervention in Maryland results in \$10.64 future cost savings for every dollar invested. In Maryland this translates into approximately \$16.8 million savings through the adult and youth programs.

**c. Source of Federal Funds:** EFNEP Program funds –USDA Smith-Lever 3(d) and state general funds

**d. Scope of Impact:** State-wide

**Project 2.1.3 - EFNEP County Example**

**a. Project Statement:** Program goal was for 400 limited income parents will gain skills, awareness and knowledge for healthy eating and lifestyle changes to decrease their risk of chronic diseases related to diet and food borne illnesses. Monthly in-service trainings that focused on updated subject matter and teaching methodology appropriate for the clientele were conducted. The recruitment of the groups of participants was conducted by the EFNEP Nutrition Assistants and the educator. Collaborations were established with parent groups at city schools and day care centers, family shelters, places of worship, community centers, drug rehabilitation centers, Mayor's Stations and more.

**b. Impact:** As a result of 521 limited income program families' enrollment (representing 1,853 family members), significant dietary improvements were made as demonstrated by data generated from entry and exit food recalls. The following data measures recommended dietary intake for each food group: Breads & Cereals 27.8% at entry compared to 52.8% at exit; Fruits 21.8% at entry compared to 65.4% at exit; Vegetables 32.6% at entry compared to 67.% at exit; Calcium/Dairy at entry 11.9% compared to 38.1% at exit; Meats/High Protein Alternatives 40.8 at entry compared to 66.3% at exit; % with 3-1-1-1 food pattern was 11.5 at entry compared to 59.4 at exit; and % with 6-2-3-2-2 food pattern was 2.8 compared to 21.6 at exit. The percentage with positive change was 96.8. Nutrient Intake at >99% of RDAs is as follows: Protein at entry was 57.3 compared to 92.7; Iron at entry was 16.5 compared to 45.2 at exit; Calcium at entry was 15.1 compared to 51.4 at exit; Vitamin A 28.4 at entry compared to 65.6 at exit; Vitamin C at entry was 43.1 compared to 85.3. The evaluation tool also indicated behavioral changes - 94% participants showed improvement in food resource management practices; 94% participants showed improvement in food resource management practices; and 80% participants showed improvement in food safety practices. All enrolled participants were parents, grandparents with custody and/or guardians of children 19 years old or younger. Ten percent of the participants were young mothers -10 to 18 years old. The racial breakdown of enrolled participants reflected the racial makeup of the city's population. Seventy nine percent were Black, 20% White and the balance consisted of Native American and Asian individuals.

**. Source of Funds:** EFNEP Program Funds- USDA Smith-Lever 3(d) and state funds

**d. Scope of Impact:** multi-county specific

**2.1.4 FSNEP Program Helps Maryland Residents At Risk for Insufficient Food to Meet Nutrient Needs**

**a. Project Statement:** The Maryland FSNEP is a collaborative program of FNS, UMD, and the MD Department of Human Resources, providing nutrition education to low income families in 13 Maryland Counties and Baltimore City. The goal of FSNEP

is to help families improve dietary quality, increase physical activity, improve food security, develop food resource management skills, and handle food safely.

**b. Impact:** Compared to FY02, the MD FSNEP FY03 reached 20% more adults and 120% more youth. FSNEP educators taught 11,974 adults, 22,286 youth, and 2,256 staff from community agencies in FY03. The majority (70%) of programs provide direct contact with participants and all single session programs were evaluated for participants intent to change behavior. Data from pre-post surveys indicated the following percentages of participants intended to make dietary changes: thaw foods in refrigerator (48%); wash cutting boards (86%); include 30-minutes of physical activity daily (57%); choose lower fat meat (55%); plan meals before shopping (74%); compare prices (58%); and eat more fruit (53%). 26% of the programming was provided as a series of lessons. Outcome assessment of 4 or more lessons in a series demonstrated as a result of participation: 82% read nutrition labels, 55 % made healthier food choices, and 95% consumed 4-5 servings of fruit and vegetables daily.

**c. Source of funds:** FNS-USDA, MD Department of Human Resources, community collaborators, and state general funds.

**d. Scope of Impact:** State-wide

### 2.1.5 - FSNEP County Example

**a. Project Statement.** Because poor health and food insecurity are closely related, an intensified effort to address the issues of food security and managing food resources to low-income individuals and families was developed. Use of food stamps is under utilized despite continuing economic hardships in Garrett County. While 2, 489 individuals are living in poverty (29% of which are 65 or older), only 2,489 (1,047 children) received food stamps in 2002. Thus, a coordinated informational outreach effort by Garrett County FSNEP was initiated involving at least 16 agencies. Posters and 1300 USDA "Food Stamps Make America Stronger" brochures were distributed to agencies working with the low-income population. These were also made available at FSNEP programs, fairs, displays, and staff trainings. It was hoped that repeated observation of these materials by clients, as well as verbal encouragement by these agencies, would increase the use of foods stamps in 2003.

**b. Impact.** This program and an informational campaign resulted in 2200 direct and 6607 indirect contacts with various low-income audiences. Learner centered discussions, hands-on activities, and written materials were used to encourage intent to change behaviors. Current statistics supplied by the local Department of Social Services show an 8% increase in use of food stamps in the past year. Now reaching 1108 households, this is the highest participation since 1994.

**c. Source of funds:** FNS-USDA, MD Department of Human Resources, community collaborators, 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 chicken breast 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 - Development of predictive models for the survival of *Campylobacter jejuni* on chicken as a function of temperature**

**a. Project Statement.** This study was done to model the kinetics of *Campylobacter jejuni* survival on cooked chicken breast patties and in broth as a function of temperature. A three phase linear model fits the primary survival curves well at all incubation temperatures, 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 (Bf) and accuracy factor (Af) 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 Funds:** USDA/CSREES, Evans-Allen.

**d. Scope of Impact:** National and regional.

#### **Project 2.2.2 – Neighborhood GRIME Watch**

**a. Project Statement.** This interactive learning station illustrates proper hand washing. The tent, itself, illuminated with black lights gives immediate reinforcement to a "job well done". Participants (physicians, parents, teachers, children) took the hand washing challenge and expressed enthusiasm for the opportunity and learning from the experience.

**b. Impact.** Follow-up anecdotal evaluations indicate participants gained the following from the tent activity:

93% responded that they learned they need to wash for 20 seconds.

72% responded that they learned how to properly wash their hands.

100% responded that they would wash their hands longer as a result of this intervention.

71% responded that they have learned where they need to wash better and will do so in the future.

**c. Source of Funds.** Smith-Lever, grants, and state general funds.

**d. Scope of impact.** Statewide.

### **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, 1890 Extension and state general funds

. **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, Safe Food)**

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. Food Safety Trainings.**

**a. Project Statement.** Participants will gain knowledge and information and develop skills to reduce foodborne illness. In cooperation with Department of Social Services, this county offered four - 2 hour Food Safety trainings for 55 Assisted Living Care Managers and their staff. Participants included Home Care managers and all regular staff as well as designated substitutes. DSS supervisors also participated in the training. The focus of the training was the safe handling and storage of food from the farm to the table. Participants received 2 hours of credit toward their state required licensing and accreditation.

**b. Impact.** Based on end-of class questionnaires, participants indicated the following:

- Before training 19% had very little or some understanding of recommended food storage practices
- Before training 30% had very little or some understanding of recommended temperatures for cooking potentially hazardous foods.
- Before training 28% had very little or some understanding of the foods that are safe and appropriate for serving seniors and other susceptible populations.
- After training 51% felt they had quite a bit or a lot of understanding of recommended food storage practices.
- After training 72% felt they had quite a bit or a lot of understanding of recommended temperatures for cooking potentially hazardous foods.
- After training 53% felt they had quite a bit or a lot of understanding of the foods that are safe and appropriate for serving seniors and other susceptible populations.

As a result of attending the food safety training:

- 91% of participants felt to a great extent they more able to select, store and handle foods properly.
- 100% planned to use the suggested food handling techniques to select, store and prepare foods properly for the people in their care.
- 89% felt they were very likely to change/improve their food selection, storage and preparation of food as a result of attending this training.

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

**d. Scope of Impact:** County Specific

### **Project 2.3.2 - Feeding the Community Safely and Feeding the Children Safely.**

**a. Project Statement.** During 2003, two previously developed food safety programs continued to be delivered on a state-wide basis. The programs were “Feeding the Community Safely” and “Feeding the Children Safely.” The programs were packaged on a CD-ROM and distributed to all FCS educators working in the food safety area. The programs addressed basic consumer food safety principles (e.g., personal hygiene, preventing cross-contamination, avoiding temperature abuse) and emphasized preventing foodborne illnesses. The programs included a PowerPoint presentation, learning activities, handouts, discussion questions, and a pre/post evaluation instrument.

**b. Impact.** Two counties (Calvert and St. Mary's) submitted evaluation data for 2003. In Calvert Co., "Feeding the Community Safely" was conducted 16 times reaching 195 participants, and "Feeding the Children Safely" was conducted 3 times reaching 96 participants. Evaluation of the pre/post test scores suggested a substantial increase in knowledge (number of correct answers) as indicated in the post-test scores compared to the pre-test scores. In St. Mary's Co., "Feeding the Community Safely" was conducted four times reaching 56 participants. Among the audiences reached in these counties were restaurant employees, Department of Social Services job center participants, residents living in shelters, church volunteers, retirees, and assisted living employees.

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

**d. Scope of Impact:** State-wide

### **Project 2.3.3 – Seafood Safety for Industry**

**a. Project Statement.** The U.S. Food and Drug Administration indicated that the control of histamine in susceptible fish species was the agency's number one Hazard Analysis Critical Control Point (HACCP) compliance problem, and that the seafood industry should expect increased regulatory scrutiny.

**b. Impact.** A team was organized from both coasts and received funding from the National Sea Grant Office to develop a national training program. Nine universities participated in 2003, and made significant progress toward meeting the stated objectives. Drafts were prepared for a brochure, static display, resource list, three model histamine control/monitoring plans for commercial fishermen, video script and website plan. Seafood organizations and regulators are providing input into all phases of the project.

Progress continued on a related grant (USDA, Virginia Tech, lead institution) to identify the effect of commercial fish harvesting and handling procedures on the formation of histamine. Maryland commercial fishermen and a fish processor participated in the study. Fish temperature histories were recorded, histamine-forming bacterial species were isolated from fish and fish-contact surfaces, and histamine levels were quantified in fish tissue. A third grant (USDA) was finalized to investigate the effects of high hydrostatic pressure on inactivation of either the microorganisms or enzymes responsible for histamine formation.

Previous changes in HACCP guidance issued by the U.S. Food and Drug Administration were at least partially responsible for seafood industry confusion, non-compliance reports and even the regulatory detention of products. In response, a model HACCP plan previously prepared by the Seafood Specialist was revised and supplemented with sample record-keeping forms for posting on the Seafood HACCP Alliance website (U.C.Davis) and for use in Alliance Train-the-Trainer programs. In 2003 these guides were further refined and expanded to include model Sanitation Standard Operating Procedures and corresponding forms for complying with federal and state record-keeping requirements. Similar materials have been downloaded widely for international use.

c. **Source of Federal Funds:** Smith-Lever 3b&c, 1890 Extension state general funds and Seagrant.

d. **Scope of Impact:** Multi-state

**Examples of research projects include the following:**

**Project 2.3.4 – Real-time Response Biosensor for E. coli**

**a. Project Statement.** The goal of this study is to enable quantitative whole-cell biosensing by developing a novel dynamic system for the immobilization of stress-responsive luminous bacteria. To date, many genetically engineered strains containing selected stress-responsive *E.coli* promoters fused to the *Photobadus luminescens* luxCDABE reporter have been developed. Use of the five-gene lux reporter system allows facile monitoring of gene expression because all components necessary for light production are present in the cell. The bioluminescence reporter has advantageous properties such as real-time response, excellent sensitivity, and large dynamic range because the product of its pathway, light production, can be easily detected. Moreover, not only do the responses of an organism to environmental insult supply instantaneous light signals, they also provide insight into the molecular mechanisms of toxicity because these responses also include repair mechanisms specific for the damage occurred.

**b. Impacts:** This research will focus on establishing a dynamic mechanism for the immobilization of bioluminescent E. coli that might lead to the development of quantitative whole-cell biosensors capable of monitoring food safety. The significance of the project is two-fold. First, of the various reporter systems available, bacterial bioluminescence has the unique advantage that gene expression can be monitored in real time without cell lysis. The stress-responsive luminous bacteria are capable of fingerprinting the specific stresses by responding with an SOS (real time) light signal. Second, the integrated cell immobilization mechanism enables rapid assembly of a biosensor for quantitative analysis of the light signals, which would have been greatly hindered in a suspension cell system. Should the signal reproducibility and stability be confirmed, it is expected that the results of the proposed research could establish procedures for rapid incorporation of similarly constructed biosensing strains.

c. **Source of Funding:** JIFSAN Competitive Grant

d. **Scope of Impact:** International

**Project 2.3.5 – Surveillance Program to Monitor Antimicrobial Resistance in Foodborne Pathogens.**

**a. Project Statement.** *Campylobacter* is a common cause of bacterial foodborne illness worldwide. The pathogen is frequently present in animal products, particularly in poultry. During the last decade, many bacteria that cause human diseases, including *Campylobacter*, have developed resistance to antimicrobials commonly used for treatment. There is currently a great deal of speculation regarding the role that

therapeutic and sub-therapeutic use of antimicrobial in animals has played in accelerating the development and dissemination of antimicrobial resistant bacteria. Since the discovery of the growth-promoting and disease-fighting capabilities of antimicrobials, farmers, fish-farmers and livestock producers have used antimicrobials in everything from apples to aquaculture. With livestock production increasing in developing countries, reliance on antimicrobials is likewise expanding - often without guidelines in those nations where antimicrobials are sold without prescription. With the trends toward globalization and the relaxing of trade barriers, inadequate standards and enforcement in one nation means all others are vulnerable. Research is urgently needed to determine the potential role of antimicrobials used in animal production environments on emergence and spread of bacteria antimicrobial resistance in both veterinary and human medicine. In this proposed study, we plan to initiate a surveillance program to monitor antimicrobial resistance of foodborne pathogens in retail meat products in China. The specific objectives of this study are to examine and characterize antimicrobial resistance of *Campylobacter* isolated from retail chickens in China.

**b. Impacts:** Microbial food safety is an increasing public health concern in the United States. The U.S. Centers for Disease Control & Prevention estimated that each year in the United States there are approximately 76 million foodborne illnesses. While most of them go undiagnosed, and thus, unreported, approximately 325,000 cases result in hospitalizations, and 5,000 cases are fatal. Antimicrobials are frequently prescribed empirically for treating diarrheal illness, including campylobacteriosis. Some studies have showed that increase in bacterial antimicrobial resistance is associated with antimicrobial use in food animal production. Food products in the U.S. have been imported from many different countries. Given the global nature of antimicrobial resistance, it is especially important to conduct studies on antimicrobial resistance of bacterial pathogens in developing countries, where inappropriate antimicrobial usage may be more common. The findings of this study will provide useful information to better understand antimicrobial-resistant bacteria in food imported from developing countries.

**c. Source of Funding:** USDA/ Scientific Cooperation Research Program

**d. Scope of Impact:** International

## **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 and other science based 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 1,300 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 46,000 individuals

**Examples of educational programs include the following:**

### **3.1.1 – Diabetes Education for Limited Resource and Minority Communities**

**a. Project Statement.** A large number of Latinos in the county have no health insurance and therefore do not have access to health and nutrition education *Classes para Diabeticos Latinos* was planned, developed, advertised, and executed by a 3-person collaborative team to meet this need. The series of 3 classes cover general information on diabetes, problems associated with the disease and methods of controlling it. Food and nutrition demonstrations provide a means of reinforcing and applying the recommendations. Families are encouraged to attend the classes. A nurse conducts 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 are completed to provide base line data for evaluation.

**b. Impact.** - Classes were conducted in January, March, June, and October 2003. 101 participants attended the classes.

-The mean reduction of Hemoglobin A1C levels was 1.1% at the 3-month follow-up. (A 1% increase in Hemoglobin A1C values is associated with a \$600-\$2000 greater per person treatment cost).

-Pre and Post-test results indicated that more participants were engaging in physical activity, eating more fruits and vegetables and reading food labels.

-Five train the trainer programs were conducted for Washington Adventist Health Care, the Gaithersburg Spanish Catholic Center and the SHARE program. A total of 54 health care workers were trained.

-27 Universities and organizations requested the curriculum on a CD-ROM in FY03.

-The program was presented at the National Priester Health Conference in Phoenix Arizona in April 2003.

-Program was awarded the Regional Mary W. Wells Diversity Award at the Galaxy II Conference.

**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 – Prevention of Diabetes and its Complications by Improving Nutrition and Health Practices**

#### **Example of an educational program includes the following:**

**a. Project statement.** The objective of this program was to prevent diabetes and its complications by improving nutrition knowledge and practices of residents. With Maryland having the fourth highest mortality rate for diabetes in the country, the need for diabetes education is well established. The local need is even more dramatic since Allegany County has the sixth highest rate in the state (U.S. National Vital Statistics, 2000) while Garrett County far exceeds the state average with a rate of 46.9/100,000 versus 28.5 for the state. What compounds this problem even more is the lack of diabetes education within the counties. To fill the gap in these much-needed services, the Educator serves as the sole provider of diabetes nutrition classes in this underserved two-county area. Physicians, nurses, and dietitians, as well as healthcare organizations refer patients to these classes.

In response to the demand, the Educator initiated and taught 23 diabetes classes, which reached a total of 740 individuals from the two counties as well as individuals from neighboring West Virginia. The healthy eating for diabetes series, which included three classes lasting two hours each, was repeated five times throughout the counties. As proof of the demand, one series in rural Garrett County grew to over 100 participants forcing the location to be changed which still did not accommodate all interested clientele. The Educator also taught single diabetes nutrition classes in addition to organizing and co-teaching classes with a physician, podiatrist, ophthalmologist, pharmacist, and nurse in an attempt to address the wide range of interrelated diabetes health concerns.

**b. Impact.** Program data were collected at the beginning of the first class and at the end of the last class of the series, as well as three months after the completion of the series. Prior to the training, only 24% of participants felt that they could manage their diabetes in comparison to 92% who claimed better management three months later. Also at the three-month follow-up, 86% of participants reported improvements in their blood glucose levels after following the meal planning tips learned in the diabetes classes. With improved blood glucose levels, individuals will face fewer long-term complications resulting in significant savings in healthcare dollars for them as well as society.

Qualitative data also provided insight into the behavioral changes made. At the last class of one series, a participant noted on her evaluation that “For the first time in my life, I understand how to make a balanced meal, lose weight, lower my cholesterol, and feel better in the process.” Another wrote, “Using this information will undoubtedly change my sugar levels and my life.” At a three-month follow-up one participant said, “I took the classes to help my husband with his diet but I changed mine too. I can’t tell you how many other people I have shared this information with.” Six months after the series, one participant claimed in a phone interview “My doctor suggested that I go to these nutrition classes so I might be able to lose some much-needed weight. Since the classes, I have practiced the diabetic exchange techniques and lost an unbelievable 55 pounds. My wife has also lost 30 pounds. This has changed our lives forever.”

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

**d. Scope of Impact:** Multi-county, state-wide, and several states have requested materials.

### **Project 3.1.3 - Multi-County. Nutrition and Health: Decrease the Risk of Chronic Disease through Nutrition and Healthy Lifestyles**

**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), Food Stamp Nutrition Education Program (FSNEP), and numerous other state supported nutrition education programs are delivering education 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), and increase physical activity.

**Program example #1:** The objective of this program was to decrease the risk of chronic diseases by improving nutrition knowledge and skills. Since almost one-half of residents are considered overweight (BRFSS, 2001) and the rates of chronic diseases in both counties are higher than the state rate (MD Dept. of Health & Mental Hygiene, 2000), additional nutrition and health education was essential. In total, twelve educational programs were designed and delivered to 247 individuals. One high demand program area among clientele was for reliable, research-based information related to vitamin, mineral, herbal, and nonherbal supplements. Six trainings were provided which addressed how dietary supplements impact specific chronic diseases, including obesity, as well as the many contraindications and warnings that exist. Other classes targeted preventative measures for heart disease and cancer, such as tips for lowering cholesterol and triglycerides; ideas for improving fiber consumption; and suggestions for eating out healthfully.

**b.1.Program #1 Impact.** End-of-class evaluations were used to measure knowledge improvements and intended behavior changes. A post-then-pre design indicated significant improvements in knowledge with regard to the recommended limits for dietary supplements as well as their side effects and medication interactions. Approximately 85% of participants claimed that they would use the information presented to make important decisions about their supplement use. When participants were asked if they really planned to use the heart-healthy nutrition strategies, 94% marked “yes” while the remainder claimed “maybe”. Qualitative data revealed that one participant planned to make “better choices with fats” while another intended to pay “more attention to making better choices when eating out.” When asked six months after the class about any changes made, a participant claimed, “I strictly followed your handout about getting your triglycerides down. I cut out the sodas completely and limited the other foods on the list and it really has made a difference in my level.”



**Program example #2:** Minority Women's Health Issues - A concentrated effort was made in one community to program for minority women with an emphasis health issues, to include breast cancer, high blood pressure, and diabetes. Thirteen specifically targeted programs were conducted in Somerset County. Programs were conducted in local communities with established church groups and minority advocacy groups.

**b.2. Program #2 Impact.** A total of four hundred and fifty African American Women attended the programs. Follow up evaluations with 25% of those attending showed 20 % will change their diet to follow a healthier eating plan, 15% will follow up with doctor's visit and 12% will become health ambassadors spreading the message on the importance of health screenings

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

**d. Scope of Impact:** county specific.

#### **Project 3.1.4 - Folic Acid Education.**

. **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:** Multi-county

#### **Project 3.1.5 – Nutrition for Good Health**

**a. Project statement.** Monthly classes focusing on various nutrition topics, some classes requested by various community groups and many initiated by county educator. The desired outcomes relate to improving community health. Given that an increased

incidence of chronic disease is directly related to poor nutritional habits, this educator presented the basic components of the Dietary Guidelines for Americans in a practical, replicable format

**b. Impact.** Through demonstration format positive changes (e.g. reducing fat, reducing sodium, less frying, increasing fruits, vegetables and whole grains) were presented. End of year evaluations indicated:

90% of respondents have lowered the fat in their diets.

90% reported lowering their selection of fat food products.

97% reported incorporating some of the healthy choice recipes in family meals.

89% reported increasing family consumption of fruits and vegetables.

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

**d. Scope of Impact:** State-wide

### **Project 3.1.6 - Summer Nutrition Program in Baltimore City**

**a. Project Statement.** According to the Center for Disease Control, children are becoming overweight at an alarming rate and are beginning to encounter chronic diseases related to poor diet and lack of exercise. The Summer Nutrition Education Program allows schools, recreation centers, faith-based organizations and community organizations the opportunity to partner with 4-H in the city to provide information on nutrition and healthy lifestyles to youth in camp settings. Program objectives include helping youth to gain knowledge about healthy eating, healthy food choices, and benefits of physical activity. Two trainings were held for the 60 sites that participated in the Summer Nutrition Program. Sites received training, the curriculum, and weekly distribution of demonstration supplies and recipes for youth to make healthy snacks.

**b. Impact.** Twenty-five hundred youth participated in the Summer Nutrition Education Program. Pre and post-tests revealed that 80% of the children gained awareness and knowledge about healthy foods and the benefits of physical activity. Evaluations from the site directors indicate the youth were making better food choices and were increasing physical activity.

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

**d. Scope of Impact:** Numerous counties

## **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 2020. 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 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.. 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 336 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 23,485 people. In addition, through the Home & Garden Information Center, 14,283 calls and 2,923 Web-based sessions 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 160 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 6,207 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 2003, through December 2003, with a 2003 total number of 5397 nutrient management plans written by MCE advisors on over 510,942 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.

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 20 of these workshops were held during 2003. A total of 120 agricultural operations were represented at these workshops, and plans were completed for 114 operations comprising a total of 12,476 acres.

In 2003, MCE developed 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. Two programs were held in 2003, in Carroll & Montgomery Counties, with 25 farmers completing the training and certified to write their own plans. This program will be repeated in 2004 in other areas of the state.

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

**d. Scope of Impact:** Multi-County Specific

**Examples of research projects include the following:**

## **Project 4.1.2 – Low Phytate Soybeans Increases Poultry Nutrition and Reduces Manure Phosphorus**

**a. Project Statement.** Soybean seeds are one of the world's most important sources of vegetable protein for human and animal nutrition. Soy protein preparations also provide minerals, but phytic acid in soy protein has been shown to reduce the bioavailability of certain essential minerals, such as Zn. The phytic acid forms chelates with metal ions including Ca, Mg, Zn, and Fe preventing these compounds from being absorbed in the intestinal tract of humans and monogastric animals such as poultry and swine.

Phytate is the principal source of phosphorus in the seed. Phytic acid is the storage form of phosphorus and accounts for 60 to 80% of the total phosphorus in soybean seeds. The unavailable phosphorus present in phytate is replaced in animal rations by adding extra phosphorus to the soybean meal. The animal excretes the unavailable phosphorus in phytic acid and manure disposal creates environmental problems in areas with high soil phosphorus. Enzyme phytase has been added to soy meal to increase phosphorus and mineral availability in poultry rations. An alternative procedure is to reduce the phytate in the seed genetically. This approach has been used with corn and high available phosphorus (HAP) corn hybrids are now being evaluated in poultry feed formulations. This approach has stimulated much interest in the Delmarva region to help reduce poultry manure phosphorus. The development of low phytate soybeans would be a desirable complement to HAP corns in reducing manure phosphorus.

**b. Impacts:** Breeding populations developed from crossing the Purdue low phytic acid mutant with productive Maryland and other conventional cultivars and breeding lines have been developed. Selection of individual plants with low phytic acid will be completed in the fall of 2002. A large number of breeding lines will be developed and evaluated during the winter of 2002-03 to identify homogeneous lines for this trait. All lines will then be evaluated in tests grown across the state in 2003 to look for productive lines that have the potential for release as new cultivars. Tests will be undertaken to determine the feeding value of these modified soybeans in meeting the nutritional requirements of Maryland's poultry industry and their utility in reducing the phosphorus content in the manure.

**c. Source of Funding:** United Soybean Board, Maryland Soybean Board, & MAES

**d. Scope of Impact:** National

## **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 255 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 sound 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 46,850 people and had over 92,000 hits on its website [www.MDIPM.umd.edu](http://www.MDIPM.umd.edu).

**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.** Nineteen workshops were held educating Homeowners, Realtors, Local Government Officials, Master Gardeners, Agency Personnel, Professional Planners, Service Organizations, and Environmental Groups. 132 Realtors received 3 continuing education credit hours by attending the Regional Specialist's training. 324 Master Gardeners received training credits, and 38 Bay-Wise Master Gardeners received additional credit hours towards their Bay-Wise Certification. On average, 54 people visit the Septic Systems web site per day, with 5/day writing for specific help. Saved at least 150 (*known*) people on average, \$1600-\$3000 each, by educating them on the need (or in most cases, lack of need) for expensive water treatment devices. Typically these people were told they needed a treatment device by a salesperson, when in fact they did not. At least another 150 (*known*) people saved on average \$300 each by learning of the unnecessary purchase of septic system additives. This doesn't account for the people who saved money by learning from the Regional Specialist's web sites and printed materials, or who did not directly inform the Specialist of their savings.

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



**d. Scope of Impact:** Multi-county & Statewide

**Project 4.2.2 – Deep Row Biosolid Application to Grow Trees**

**a. Project Statement.** Develop applied research and education program to encourage adoption of use of municipal biosolids in deep-row applications to grow hybrid poplar trees on gravel spoil sites.

**b. Impacts:** A partnership was developed with private firm (ERCO, Inc.) in Prince George's County, WSSC, and MCE to secure grant funding and implemented extension education program for industry and agency personnel. Biosolids are applied in trenches on a gravel mine spoil, and then planting the site with hybrid poplar trees to utilize the nutrients in the biosolids over a 6-year rotation time. Educator has worked cooperatively with Gary Felton of UM Biological Engineering and Eric Flamino of ERCO, Inc. on a planned series of educational and research activities this year to secure funding and wider implementation. Agent has organized and led the following activities in the last year:

MCE has secured state recognition of tree operation as qualifying for woodland assessment for tax purposes by the DNR Forest Service. This will result in property tax reduction of \$21,000 per year for ERCO, Inc., and sets a precedent for other sites that may be established.

A field day was organized in October for 35 industry, university, and regulatory professionals (MDE, MDA, county agencies) that resulted in identification of additional research questions. As a result, a proposal has been requested by WSSC and other partners to answer the needed questions. A draft \$70,000 proposal has been developed and will be submitted in early 2004. McIntyre-Stennis funds of \$36,000/three years were secured this year.

**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 finger 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 loose-leaf 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.** Regional Specialist was *invited* to give 31 presentations. Seven of these were *National* invitations to present to a National audience. Ten were presentations at the State or multi-State level. The remaining presentations were at the county level throughout the entire state of Maryland. More than 2,250 people were in attendance at these programs. This doesn't include the number of people who heard the radio broadcasts, watched the television shows, or read the newspaper articles related to some of these programs, or the over 30,000 that visited the Regional Specialist's web sites for information. Actual teaching hours totaled 3,630. Absent from this number is the amount of one-on-one teaching via email and phone correspondence. Also, 2 Maryland Public TV and a University of Maryland TV show featuring the Regional Specialist are aired monthly, to a *National* audience. 170 Lawn Care, 215 Greenhouse Growers, and 250 Landscape industry personnel received continuing education credits and/or re-certification credit for attending the Regional Specialist's programs. 166 EPA Region III State Pesticide Inspectors (Maryland, Delaware, Virginia, West Virginia, Pennsylvania and the District of Columbia) received re-certification credits for attending a Regional Specialist's program.

A Chesapeake Bay Trust grant was received for a *Bay-Wise Landscaping* program. In 2003, 38 Master Gardeners received *Bay-Wise* certification, and a demonstration garden was planted for use in promoting native species landscaping.

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

**d. Scope of Impact:** Multi-County & Statewide

#### **Project 4.2.4 - MD Master Gardeners Program (Volunteers Help Home Gardeners Reduce Pesticide Use & Improve Water Quality)**

**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.

**b. Impact.** Created agendas and conducted four meetings (4 hours each) with the Master Gardener Advisory Board to address training, volunteer policy and management issues, and program goals. Communicated with MG coordinators and MG leaders on a regular basis. Two-hundred Eighty-nine individuals completed the Master Gardener training program in 2003, a 23% increase over 2002. Approximately 848 Master Gardeners reported 52,311 volunteer hours in 2003- a 23% increase over 2002. The value of the 2003 volunteer service was estimated to be \$865,223 by the Governor's Office on Volunteerism and Service. Principal Master Gardener goals are to help achieve a reduction in unnecessary pesticide and fertilizer use by Maryland residents and to promote wise use of natural resources. ([www.mastergardener.umd.edu](http://www.mastergardener.umd.edu)). Organize and coordinate the all-day Advanced Training for Master Gardeners at College Park (May, 2003). Twenty-eight learning sessions were taught by 26 invited presenters; 287 Master Gardeners paid to attend. One-hundred ninety-four participants completed an evaluation form and rated the event at 4.3 (averaged) on a 1-5 scale (5=highest). Five-hundred eighty-five handbooks were sold in 2003; 186 were sold to Rutgers Extension and used to train Master gardeners in seven New Jersey counties and to the University of the District of Columbia MG program. Thirty-three MG trainees in Anne Arundel Co. took a pre- and post test developed by the state coordinator to evaluate knowledge gained in two key areas- integrated pest management and urban nutrient management. The average score rose from 47% to 82%.

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

**d. Scope of Impact:** Multi-County

#### **Project 4.2.5 – Greenhouse Integrated Pest Management**

**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.

To help Maryland greenhouse managers stay on top of current insect, disease and fertility problems with greenhouse crops and to sustain and expand use of IPM techniques.

In a written survey conducted at MGGGA educational event growers told us they need current information on what insect, disease and fertility problems were occurring in Maryland. They were also interested in using IPM methods that reduce plant losses. Toward this end we published a weekly 1- 2 page electronic e-mail list serve IPM report sent to all Maryland greenhouse and Extension offices in the state. Reports are then posted to IPMNET (CMREC web page). Obtained \$1000 funding from the Maryland Greenhouse Growers Association to support technician's time working on this project.

To help growers evaluate new low risk pesticides and investigate biological control in commercial greenhouses in Maryland.

**b. Impacts:** Recruited 5 professional scouts and 82 greenhouse managers to participate in reporting in insect, disease and fertility problems. The reports are pulled together each week at our office and working with Ethel Dutky we put in IPM suggestions for control. This regular close contact with growers encourages use of IPM methods in growing their crops. Presently we have 32 greenhouses in Maryland actively using independent IPM professional scouts that are trained by Cooperative Extension. All participating greenhouses keep plant losses under 1%/year.

Working with Bayer Company, FMC, SynGenta, Valent Company, Eden Bioscience, and Ball International we conducted 5 field trials with Maryland growers to evaluate new low risk pesticides and alternative control methods for dealing with insect pests in greenhouses. We obtained funding, from the aforementioned companies, of \$34,750 to support this work.

As a result of trials we published 3 articles in national professional trade magazines and produced 3 refereed journal articles on the evaluation of these materials. We also used this information in formulation of a 200-page publication on Total Plant Management for Greenhouse Management, which will be published in 2004. Growers use this information in their decision-making in controlling insect pests. In 2003 presented the results of the trials to growers at the Maryland Plant Growers Conference (fall of 2003) and the Maryland Greenhouse Growers Conference (Winter of 2003), and at the Ball International Perennial Plant Growers Conference in Chicago, IL. We will publish the results of the remaining 2 trials in trade journals in 2004.

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

**d. Scope of Impact:** Multi-County & Statewide

#### **Project 4.2.6 – Home & Garden Information Center**

**a. Project Description.** The Home & Garden Information Center is the main center for providing information & training to citizens of Maryland on environmental, home horticultural and water quality issues. The main focal point for 2003 is to: 1) grow the Home and Garden Information Center (HGIC) as a national model for delivery of environmental horticulture information and education, 2) develop and disseminate information on backyard and community food production, integrated pest management (IPM), plant problem diagnosis, composting, soils and fertilizers to MCE staff, HGIC horticulture consultants, Master Gardeners, clientele groups, and the public through classes, demonstrations, applied research, fact sheets, print and electronic media, and the Web, 3) public adoption of environmental horticulture practices- in particular, to reduce unnecessary fertilizer and pesticide use.

**b. Impacts:** HGIC horticulture consultants assisted, 14,283 clients. The HGIC web site had 497,000 individual user sessions in 2003; a 67% increase over 2002. 12,200 fact sheets were ordered via the website; 103,000 fact sheets were downloaded in pdf format. HGIC consultants reviewed and amended the answers to 784 of the 2,940 e-mail questions received by HGIC in 2003. Provided expertise in numerous subject areas to 8 phone consultants who operate 3-6 HGIC phone lines from 8am – 1pm

Monday through Friday, year-round. Analyzed 115 plant and insect samples and distributed 36,400 fact sheets, 8,400 magnets, 17,200 bookmarks, and 1,760 soil test kits. Provided training to volunteers in the following areas: 2-week “Winter School”; 8 presentations (2-3 hours each) by campus and field faculty and outside speakers; one day (Dec. 2) training at Howard County MCE office; 6 presentations by campus and field faculty on timely topics. Review and approve a newspaper column- “Ask the Plant and Pest Doctor”- produced by a HGIC consultant every 2 weeks.

Electronic survey of clients who sent in a question via e-mail related to a pest problem: 86% of respondents (n=91) reported that HGIC helped them correctly identify the problem, 51% reported that they used alternatives to chemical pesticides as a result of our recommendation, and 51% claimed that they learned how to prevent the problem next year. This translates into economic savings, fewer toxics negatively impacting the environment fewer toxic materials that homeowners and landfill operators have to deal with. The same outcome would be expected from a sample of callers to the HGIC “hotline”.

**c. Source of Federal Funds:** State Funds

**d. Scope of Impact:** Multi-County & Statewide

#### **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 24 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 1,545 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

and soil profile movement 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 from soil.**

**a. Project Statement.** This project was to determine the effectiveness of coal combustion by-products for reducing solubility of dissolved P in soils with elevated P levels due to long term poultry litter application. The study involved the use of Forty-eight surface runoff boxes, equipped with five gallon water collection containers, treated with coal combustion by-products (CCP): fluidized gas combustion gypsum (FGD), flue bed combustion flyash (FBC) and anthracite refuse ash (AFA). The study was conducted at the UMES Agricultural Experiment Station on a site that had been treated with poultry for approximately twenty years.

**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 -University Park, Pa. 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 as much as 68% depending on the CCP used and the rate applied. These substances also have the potential to provide a cheap and effective means of reducing eutrophication 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

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

**Project 4.4.4- UMES - Development of national and international standards and performance specifications for protective clothing materials**

**a. Project Statement.** The International Organization for Standardization (ISO) Draft for International Standards entitled, "ISO DIS 22608 - Standard Test Method to Measure Repellency, Retention, and Penetration of Liquid Pesticide Formulation through Protective Clothing Materials" was approved. The tests have been completed by the three NC-170 member laboratories and two laboratories from other countries. Background information including performance specifications and test methods for other PPE from the US, European countries and New Zealand were obtained and reviewed. Request to initiate a new activity entitled "Performance Specification for Work and Protective Garments for Agricultural Pesticide Workers" was submitted to ASTM F23 and a presentation was made at the June 2003 meeting. The F23 has approved the development of performance specifications as a new activity. The percent

repellency, percent retention and percent penetration data for woven, nonwoven and multilayer fabrics was completed. The data has been submitted for statistical modeling.

**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. International standards and performance specifications will also assist in the selection of appropriate PPE for agricultural workers. A task group has been formed that is being chaired by a UMES professor. A preliminary draft of the performance is being developed to be distributed to task group members. In addition, individuals from the pesticide industry, governmental agencies such as the EPA, NIOSH and USDA, and international experts involved in the development and standardization of test methods have agreed to provide input (in various capacities) in the development of the proposed performance specifications.

**c. Source of Federal Funds:** Evans-Allen- 1890

**d. Scope of Impact:** National and international

#### **Project 4.4 5 - UMES - Reduction in Animal Waste Pollution through the Use of Enzymes to improve phosphorus digestion**

**a. Project Statement.** Work during the year focused on the gene component of the study. Tissues were collected from the 72 selected birds and from these birds 12 birds from the high weight and 12 from the low weight groups were identified as having superior or inferior nutrient absorption. RNA was extracted from the 24 specific birds from duodenum, jejunum, and ileum tissues. Micro arrays, constructed on glass slides, consisting of 3,840 unique chicken intestine cDNAs were screened to determine if differences in gene expression could be determined between the two extreme weight groups. Focused macro arrays constructed on nylon membranes, consisting of 384 unique cDNAs shown to be involved in Calcium and Phosphorus metabolism were further screened to also examine the differences in gene expression between the two extreme weight groups. Several genes (>20) were found to be up or down regulated between the two weight groups across multiple regions of the intestine, many of which have known relationships to Calcium and Phosphorus metabolism. The expression pattern of these genes identified by the array analyses, were verified using real-time quantitative PCR. Further characterization of the impact of these genes on nutrient absorption/utilization is needed. Verification of results by replication of the experiment at lower Ca/P levels is prudent and in the planning stages for 2004.

**b. Impact.** Identification of a genetic marker which influences phosphorus utilization will enable geneticists to evaluate and select lines which may decrease phosphorus excretion.

**c. Source of Federal Funds:** CSREES - Capacity Building

**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 69 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 3,332 people.

### **Examples of educational programs include the following:**

#### **Project 4.5.1 - Coverts Project.**

**a. Project Statement.** Teach forest landowners and managers to use forest management practices to improve wildlife habitat and other forest benefits. Trained cooperators will become credible advocates for sound forest and wildlife management in their communities - committing about 5 hours per month. This is a 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. 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.** Provided leadership, organized the 3.5 day training workshop with 18 inside sessions and two half-day field tours, and taught 11 of the inside sessions and both field sessions. Entire program is linked to the DNR Forest Stewardship Program. Regular communication with cooperators by E-mail, newsletters, and other means is maintained.

About 500 applications were mailed to recruit 30 qualified applicants, of which 24 attended the 3.5-day training workshop. A reference manual, signs, business cards, brochures and other aids were developed for program. Cooperators reported an average knowledge gain of 1.7 points on a scale of 1 to 5 when comparing knowledge level prior to, and after completion, of the training workshop. Three newsletters were provided to cooperators to communicate regularly.

Since 1990, 346 cooperators have been trained - 24 cooperators in 2003. The educator, extension assistant, and cooperators organized a one-day refresher course attended by 38 cooperators that focused on organizing a local woodland owner association.

The annual 2003 survey was sent to active cooperators with (63) returned. Results indicated the following: 9,446 people received information on forest/wildlife management or the Coverts project from all efforts, with 2,222 of those being personal contacts. 57% had organized some event that included forestry or wildlife information, 28% used the media to inform people. Items distributed included: 189 brochures; 204 business cards, as well as reference materials. 85% took steps in managing their own

properties on a total of 3,930 acres mentioned. About 34% reported that other woodland owners had sought professional management assistance as a result of their efforts, affecting 3,265 acres. Cooperators reporting 2,432 hours devoted to outreach to friends, neighbors and community, or 39 hours per year on average - two-thirds of the goal of 60 hours per year set for the program. At \$9/hr it amounts to \$21,888 in volunteer time. 8,785 hours were spent by cooperators managing their own properties. At \$9/hr amounts to \$79,065 in labor. 100% 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 (forestry boards, forestry associations) 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 managers, called "cooperators," have received training through the Coverts Project. In a typical year, almost 1,200 people receive information on forest/wildlife management from these volunteers. One hundred and fifty-five 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 19 programs in 7 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 1,815 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, 4-H's 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 2004. 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 35 farmers have adopted wildlife planting as a result of this fact sheet. MCE regional specialists' taught a class on ecology and ecosystem services to 27 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 a 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.

. **Scope of Impact:** Multi-County Specific

**Project 4.6.2 – 4-H Wildlife Food Plots**

**a. Project Statement.** There is an increasing need to educate youth to the needs of the environment and the protection of wildlife in this increasingly urban county. There is also a need to work with other community groups with similar concerns and to adapt the methods of 4-H to meet these changing needs and compliment the other organizations.

Charles County 4-H received a grant from Quail Unlimited to plan and implement a conservation management program for Southern Maryland that would focus on developing Food Plots for Wildlife.

**b. Impact.** Working with the local Southern States Cooperative, 4-H Volunteer Association, College of Southern Maryland, and Mirant Utilities, 90 youth planted 16 acres of land to provide habitat and food for small animals and birds. Youth gained new knowledge of the environmental needs of wildlife in a changing environment. Funds from this grant were also used to match a second round of funds received from National 4-H Council for a Tree Granting program which began in 2002 after the LaPlata tornado. In 2003, a total of 5000 seedlings on nine acres were planted. Some of this acreage was adjacent to a food plot site. 78 participants learned the value of riparian buffers, and how to prevent erosion into streams. They also developed an appreciation of teamwork across the community and realized how much they could accomplish with the concentrated efforts of many. Community groups participating in this effort included Boy Scouts, Master Gardeners, Arch Bishop Neal School families, Charles County Garden Club, Port Tobacco River Conservancy, Gallop Organization employees, and Girl Scouts.

**c. Source of Funds.** Smith-Lever, grants, and state general funds.

**d. Scope of impact.** County specific.

### **Project 4.6.3 - UMES -Impact of Population Reduction on Movement, Health, and Reproductive Behavior in Nutria**

**a. Project Statement.** This project examines the impact of population reduction on movement, health, and reproductive behavior in nutria. This information is necessary to develop effective control strategies to prevent further damage by nutria. The objectives of this project are: 1) to evaluate the effects of population density on home range and movement patterns of nutria (*Myocaster coypus*), 2) to ascertain if the health of the nutria population is related to harvest intensity, 3) to determine how population dynamics of nutria affect their reproductive behavior and 4) to elucidate the temporal patterns of gonadal steroid secretion in nutria during their reproductive cycle. Two treatments and two control areas were examined to determine the effect of population reduction on the movements, health, and reproductive behavior of nutria. Prior to initiating the study, nutria in all areas was identified by tagging to generate accurate population estimates. The second treatment areas underwent intensive nutria harvest by trapping and hunting to significantly reduce the resident nutria population. The control areas were not subjected to intense nutria harvest.

**b. Impact.** Removal of this invasive and exotic species is important to minimize future wetland loss on the Eastern Shore of Maryland. Our findings suggest that the control or eradication of nutria is more time-consuming, labor-intensive, and expensive than originally anticipated. Nutria inhabits very remote and inaccessible habitats. In addition, trapping year-round during the extreme temperatures in summer and winter months is very difficult for field personnel.

**c. Source of Federal Funds:** CSREES-Capacity Building

**d. Scope of Impact:** Delmarva Peninsula/National



## **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.

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. Youth civic engagement, youth-adult partnerships, and youth empowerment have become significant issues.

Volunteers provide educational, economic, and social benefits to families, individuals, organizations, and communities. Over 3,500 adults and 1,000 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 approximately 130,000 people.

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

Partners in these programs included numerous youth-serving agencies and groups, all public schools systems, 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, the financial industry (private and non-profit) and many additional governmental, NGO's, and private sector agencies, organizations, associations and businesses. 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;
- Availability and access of affordable child care;
- Healthy lifestyles;
- Community leadership development;
- 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, 1890 Extension, 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 643 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 15,000 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, Youth Leadership, Youth-Adult Partnerships, Youth Empowerment)**

Maryland Cooperative Extension educators developed over 66 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 6,000 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 III in January 2003. Class II traveled to Cuba and graduated in early 2003.

**b. Impact.** All 23 Fellows of Class II 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 – Youth Civic Engagement**

**a. Project Statement.** In Maryland, local boards, including county fair boards, that develop and implement policies and programs that address youth issues are typically comprised of adults and offer little or no opportunity for youth to engage in decision-making. The 4-H Youth on Boards project was designed to:

- Provide teams of youth and adults from four communities with training to build leadership, communication, and decision-making skills that will enable them to function effectively as youth-adult partner teams.
- To initiate or increase youth engagement in the civic life of their communities, through their active participation as equal partners on local boards and councils.

Thirty youth and adults from four Maryland counties participated in a weekend training conference to enhance youth-adult partnership skills and develop action plans for increasing youth involvement in civic governance and decision-making in their local communities. As a result, to varying degrees, each team started the process of engaging youth in local boards that make decisions that affect youth.

#### **b. Impact.**

Participants in the project, adults and youth, gained an appreciation for the role of youth in communities, particularly as members of boards and councils. In one community, youth became more aware of the potential they have for making a contribution. Although full and equal participation of youth on boards in the four communities was not achieved in this six-month project, the following impacts have been identified:

- In two communities, elected adult officers of county fair boards acknowledged the importance of youth participation and have supported the development of “junior fair boards” as a first step toward equal partnership.
- Organizations whose representatives participated in Youth on Board training in their community, will work to more actively involve young people in decision-making roles on local boards and committees.
- Adult members of the YAP teams in the four communities are committed to equal partnerships that will result in equal participation of youth in civic governance and decision-making.
- Board members in the four communities will continue the dialogue and are open to more training about how youth can be fully engaged.
- A total of 274 youth and 185 adults were reached through this project by the four teams.

**c. Source of Funds:** Smith-Lever 3b&c and state extension funds, two grants.

**d. Scope of Impact:** State-wide

### **Project 5.3.4 – Youth-Adult Partnerships**

**a. Project Statement.** Local, state and national conversations on youth development conducted by 4-H in 2001-2002, identified priorities for youth development programs. Youth civic engagement and youth as full partners were identified as two areas of focus for youth development work in the next 3-5 years. Positive youth development

programs recognize the need for young people to make connections to their communities and value youth as community resources for problem-solving and building on the assets and strengths of a community. Youth and adults can work as partners to make a difference.

Program Objectives:

- Youth and adults identify and develop knowledge, skills and attitudes for effective youth and adult partnerships
- Youth in three rural Maryland communities will become engaged in community decision-making in partnership with adults in community organizations and agencies.
- Youth and adults in three rural communities will build their capacity to make community change and strengthen positive youth development opportunities for children and youth in their communities.
- 4-H clubs will be established in one or more after-school sites by youth in partnership with adult staff.

Funding through National 4-H Council for the Engaging Youth, Serving Community has allowed for the development of pilot youth/adult partnership projects in 10 states in the northeast, including three projects in Maryland. The regional training will serve as a model for county-based youth adult partnership training to be conducted in the spring of 2004. Additionally, the Carroll County YAP team is working on increasing youth participation in decision-making and leadership roles on the county fair board. In two Maryland counties, 4-H educators participated in training to support youth/adult partnerships for afterschool program development. Both county programs have developed and delivered positive youth development experiences in afterschool settings. The 4-H Reading Buddies after school program in Talbot County engages youth as “buddies” or mentors for younger children in a literacy education program. In Calvert County, 4-H afterschool teen ambassadors are being trained to start 4-H clubs in afterschool settings.

**b. Impact.** A national evaluation project is being conducted. All three Maryland counties are participating in the study. Program impacts will be reported in the fall of 2004. The three counties and the state 4-H faculty member complete reports every four months.

**c. Source of Federal Funds:** Smith-Lever 3b&c, state general funds, and National 4-H Council grant.

**d. Scope of Impact:** State-wide

#### **5.4 Strengthen skills and knowledge to achieve economic stability**

**(Key Theme – Estate Planning, Family Resource Management, Retirement Planning, MD Saves, Financial Security for Later life)**

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 400 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 almost 11,000 people. For example, in Baltimore City, MCE provided training in financial counseling to 91 social service caseworkers that work with financially troubled families. This program has multiplied and now is reaching 1,000's of low-income individuals and families in Baltimore City.

**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 program is partially 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 2003. 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

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

**d. Scope of Impact:** State-wide programming

### **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: Multi- County.**

### **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, Grandparents as Parents)**

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 – St. Mary’s County Childcare Provider Development**

**a. Project Statement.** 301 providers, 268 practicing or seeking licensure in Southern Maryland and 33 from across the state, participated in 10 workshops and trainings for early childhood educators at various locations that were conducted by this educator. With the increased prevalence of type 2 diabetes in children, and more children with type 1 diabetes being cared for outside the home, the "Diabetes in Children" workshop was a priority training. Other topics per provider and provider trainer requests included: "Nutrition for Infants and Children", "Kitchen Fun with Kids", "Developing Curious Cooks", "Designer Foods for a Modern World", and "Feeding a Young Learner". Interactive, experiential workshop/presentations formats were employed using Power Point presentations previously developed by this educator. For each topic, objectives were for providers to: gain a better understanding of the subject matter; relate and integrate subject matter into quality care for children; learn ways to promote good health and prevent development of chronic disease through healthy diet and lifestyle; and learn ways to manage children with special needs in the child care setting.

**b. Impact.** Post-assessment of 53 participants immediately following the Diabetes in Children class reveals: 42% strongly agreed and 58% agreed that they had a better understanding of what diabetes is, how it is managed and how it is prevented; 58% strongly agreed and 42% agreed that they learned ways to prevent or manage diabetes; and 95% (36/38) correctly stated specific diet and physical activity steps they could take to promote good health and prevent the development of type 2 diabetes in children.

Of the 67 participants who completed post-workshop evaluations for Kitchen Fun with Kids, 93% felt more able to provide interesting, enjoyable and safe food experiences for children. 96% plan to use the techniques learned in the workshop to encourage healthy eating in children.

Results of the 38% (8/21) returned 3-month follow-up evaluations for Developing Curious Cooks reveal that, as a result of the workshop: 75% of providers stress to children the importance of washing hands before eating and working with foods; 50% use strategies to encourage the development of healthy eating among children in their care; and 40% offer food experiences from the training to encourage children to make healthy food choices, involve children in food handling activities and encourage children to try new foods through ideas presented in training.

76% of the 33 providers who attended the Kitchen Fun with Kids workshop at the Maryland State Family Child Care Association Annual Meeting rated the workshop as "excellent", while 24% rated it as "good". For various trainings at the Southern Maryland Child Care Resource Center, the providers (57) that "strongly agreed" with these statements is as follows:

82% for "The information presented met my needs."

95% for "The trainer was knowledgeable and well-prepared."

97% for "I understood the information that was being presented."

86% for "Overall, the trainer provided me with information that I will use in my community child-care program."

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

**d. Scope of Impact:** Multi-county

**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, Positive Youth Development, 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

### 5.6.2 - Kids Taking Charge – Youth in Self-Care

**a. Project Statement.** Every Day millions of children arrive home from school, while parents are still at work. According to the Urban Institute findings, about 4.4 million 6-12 years olds with working parents are home alone in self-care situations on a regular basis. In response to this need, the Montgomery County 4-H Kids Taking Charge (KTC) program was initiated to reach youth ages 8-12. The key goal is for participants will demonstrate making decisions and taking action to behave responsibly when home alone, demonstrate competence in key personal safety issues and procedures, develop constructive use of time, increase self-esteem to reduce negative peer pressure and the incidence of crime, and potential drug/alcohol abuse.

In 2003, a new KTC curriculum was developed to be used as a resource for Educators. (The curriculum included a leader guide and parent and youth handouts and is also available for sale). 20 Public School Counselors and 5 adults from other youth serving agencies were recruited and trained to provide the program in schools, and after school programs.

**b. Impact.** 30% of the participants provided the program at their respective schools and communities in Winter and Spring of 2003. Most of them plan to implement KTC on an annual basis to address the personal safety components within the student Services Standards. The program 290 youth. Based on end of session, and verbal evaluations, and as shared by the counselors and teachers, 90% of the participants indicated that they feel confident to make constructive decisions when faced with situations, 75% can identify a stranger and recognized emergency and non-emergency situations, 55% increased skills in dealing with their fears of loneliness and boredom, by involving

themselves in creative hands on activities. 85% of the counselors said that the program is very relevant and practical to their schools and community. The School Counseling Department purchased 60 curriculums to be used by other counselors. The curriculum has been used nationally and was presented at two national conferences and three state conferences.

. **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 Puppeteer 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. Performances were scheduled with all 21 second and fourth grades in county elementary schools in 2003. 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.** 2,422 elementary students, 18 day campers and 100 Fair participants experienced disability awareness training, learning about specific disabilities and how to interact with others who are different; 14 youth learned puppetry/drama skill, teamwork, public speaking skills, knowledge of disabilities, and value of volunteering to educate others.

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

**d. Scope of Impact:** County Specific

#### **Project 5.7.2 Baltimore City. Feeding the Hungry.**

**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. Their efforts have resulted in two years of grant funds from Kraft Foods, Inc. for \$1250 annually.

**c. Source of Funds:** Smith-Lever 3B&C, 1890 Extension and state general funds; grant funds.

**d. Scope of Impact:** Multi-county

## **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. Its 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 existing 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 domains, and working with the agriculture and waterman communities to bridge 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 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 150 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 Funds:** Smith-Lever 3 b & c; 1890 Extension, PowerUp grant; NSF grant, County donation; and state general funds.

**d. Scope of Impact:** County Specific

### **Project 5.8.2. – 4-H After School Initiative**

**a. Project Statement.** Objectives:

- MCE educators, community afterschool partners and 4-H youth/adult volunteers recognize 4-H Afterschool as a quality youth development delivery method for Maryland 4-H.
- Increased participation by underserved and underrepresented youth and adults in Maryland 4-H Youth Development programs.
- Extension professionals and community partners will increase skills and knowledge for 4-H afterschool programming.
- Higher quality programs offered in community-based afterschool settings.
  
- A 4-H Afterschool Professional Development Series has been developed to provide training for 4-H youth development educators and staff, youth and adult volunteers, afterschool providers and other community partners:
  - The 4-H Afterschool team presented an overview conference of the 4-H Afterschool Initiative to introduce key concepts and resources for 4-H educators on July 21, 2003, via distance education.

**b. Impact.** Twenty-five Extension professionals have been trained to use the 4-H Afterschool in a Box Curriculum and/or the ECI Evaluation system. Twenty-three afterschool staff received training about 4-H youth development resources at the Maryland Afterschool Conference in August. To date, 4-H has been included in a successful proposal for funding an afterschool program in Baltimore City. Maryland 4-H has been represented at the statewide planning sessions for Lights on Afterschool, a recognition of the contribution 4-H does and can make to the afterschool efforts in Maryland. Talbot County and Baltimore City participated in LOA events in their communities. Baltimore City was a part of the Maryland Signature Event for LOA. Thirty extension professionals developed skills in grant writing for 4-H Afterschool, marketing and evaluation for 4-H Afterschool, and Building Assets in 4-H Afterschool programs. 4-H Afterschool Initiative will become a part of the MCE Child Care and Afterschool Program Focus Team.

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

**d. Scope of Impact:** State of Maryland



## **Part A. Planned Programs (continued)**

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

#### **Project 6.1.1 - UMES - Development of a Distance Education Classroom**

**a. Project Statement.** This project established an interactive video teleconferencing classroom to delivery courses leading to the bachelor's degree. This delivery system currently transmits educational courses in early childhood-leading to a bachelor degree. Plans are underway to expand course offering to dietetics and family and consumer sciences teacher education certification. The project links students from the Eastern Shore Higher Education Center located at Chesapeake College to educational opportunities at the UMES. This project has been extremely beneficial to Head Start personnel and primary caregivers in rural area.

**b. Impact.** Increase number of individuals with formal training in early childhood/child development. This project is making it possible for more rural residents to complete a college degree that will help them to be more productive in their jobs without having to leave the Eastern Shore.

**c. Source of Funds:** CSREES- Capacity Building

**d. Scope of Impact:** Regional

#### **Project 6.1.2 - UMES - Enhancing Instruction through Web-Assisted Courses**

**a. Project Statement.** Technological advances over the last decade have greatly enhanced the opportunities to develop teaching modules to assist students in the learning process. Funds were sought and acquired to upgrade three UMES classrooms that allow faculty and students to infuse technology into instruction.

**b. Impact.** Preparing society ready graduates with advanced technological skills. Enhanced departmental operation and tracking systems with web modules and databases were established. Four online teaching modules were developed for Introduction to Textiles, Clinical Nutrition, Food, Clothing and Shelter, and 20th Century Costumes courses. These interactive modules enhanced faculty instruction while also making it possible for students to work outside of class to review course information at their own pace, as well as test their knowledge using the self-assessment feature. This system has been very beneficial as a teaching tool for identified courses at UMES. The Textile module is being submitted for copyright and will be available for use by other institutions.

**c. Source of Funds:** CSREES- Capacity Building

**d. Scope of Impact:** National

## **University of Maryland College Park Accomplishments FY03**

### **Focus and lead CIT to even higher levels of excellence**

- \* Completed visionary comprehensive 5-year strategic plan, crafted and supported by staff.
- \* Initiated new project management system emphasizing customer satisfaction, quality products, and timeliness.
- \* Completed visits to all county offices (and department chairs) to establish a dialogue around county faculty/staff needs and new CIT tools/services that might be used to address those needs.
- \* Created effective synergy among CIT staff during these county visits. All CIT staff (including administrative assistants) visited at least 2 counties and some many more. These visits allowed CIT staff to share among ourselves new ideas and strategies while seeing firsthand how many of our products and services are being applied in real world settings. Received positive feedback from county faculty and staff. Extremely beneficial to CIT.

### **Promote faculty and staff**

- \* The College web site remains our key strategy for providing seamless access to the College's educational resources. It is also a major vehicle for promoting the achievements of our faculty and staff. New web tools as part of our content management system enable in depth faculty/staff profiles, on-line newsletters, calendaring system, hot topics for major events, and front-page marketing splashes as needed.
- \* Regular submissions to University news outlets, i.e. Outlook, Diamondback, new Terp Magazine. Stories are pitched as needed.
- \* AGNR published news releases are compiled from the University Clipping Service and emailed to all faculty/staff on a regular basis.
- \* 3 issues of MomentUM (September, February, and June) were distributed to 10,000 alumni and friends of the College. Extra copies are distributed to County Education Centers for use with local stakeholders.
- \* CIT coordinated media coverage and crisis communications for major events affecting the College and its faculty (academic and field). Worked closely with University Relations on College media events and marketing campaigns. Designed and developed the Building a Stronger Maryland campaign which was used by local educators to market county successes.

### **Recruit and retain excellent staff and unit managers**

- \* During 2003, CIT lost 12 positions and 21% of our budget. Closing of the print shop was handled with sensitivity and support for staff. Alternative staffing arrangements provided continuous service in IT and for distribution of existing and new publications. CIT team provided timely and clear communications to address many faculty/staff concerns during this transition period.
- \* CIT staff and unit managers are encouraged to take advantage of professional development opportunities especially those offered locally and free of charge. New skills training is critically important with adoption of new technology and web-based solutions/strategies.

### **Maintain quality leadership team, serving all units within the College**

- \* CIT leadership team is comprised of a coordinator for each of 4 areas: media services, marketing/media relations, IT, and e-Learning as well as the administrative coordinator for

the unit and myself as associate dean. This group meets bi-monthly or as needed. Major initiatives/progress/problems/successes are shared and new strategies/problem solving techniques are discussed.

\* Traditionally, CIT units are almost exclusively funded by Cooperative Extension, hence the majority (75%) of CIT services are used by Extension faculty/staff whether located in the field or on campus. However, an on-going challenge for CIT is to creatively add value to existing departmental resources and research programs. New efforts are underway to address departmental websites, web branding for the College and greater support for faculty users of WebCT.

### **Relate outcomes and achievements to undergraduate and graduate education**

\* Designed and developed an on-line web-based advising system that is being shared with others departments on Campus.

\* Work with the academic programs office to support alumni events (banquet, exhibits, marketing items, newsletter, etc.) Maryland Day activities, marketing of new academic scholarships/programs.

### **Extend College's outreach and extension mission**

\* 75% of MCE education centers were upgraded to high-speed ISDN connections, a significant increase from their 56K frame relay connections. This upgrade enables field faculty/staff to experience faster downloads and uploading of data, greater access to campus business functions such as ELF and travel applications, greater use of e-Learning strategies and content management via their local websites.

\* Produced a CD-Rom of Extension publications, distributed free of charge to all MCE field locations. Over 50% of existing publications inventory is on the CD. Efforts are underway to place 100% of current inventory into a pdf database.

\* Designed and developed a prototype for future pesticide manuals. EB 237 is an on-line searchable database with 4 major sections addressing pesticide use.

\* CIT continues to provide editing and graphic design services, however, printing is outsourced using a variety of vendors. Outsourcing is also provided for business cards, letterhead, etc.

\* Developed an on-line publications tracking system to facilitate timeliness and efficiency in producing publications.

\* Offered a 2-week faculty development series to train campus and field faculty on a variety of topics relating to information technology, videoconferencing, web-based applications, and e-Learning.

\* Supports a statewide Polycom (video over IP, H.323 standard) videoconferencing network for Extension.

### **Encourage faculty to seek funding for e-Learning initiatives**

\* CIT in collaboration with the Department of Nutrition and Food Science, JIFSAN and FDA received a grant of 350K to develop a series of food safety and risk analysis courses primarily for FDA employees. The team is currently in year two of this effort with two successful courses completed.

## 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.

#### University of Maryland College Park Program Updates on Progress

##### Compliance Activities including Employment, Employment Highlights

- \* State Selection Committee for Extension Faculty adopted criteria for ensuring more diverse candidate pool; search committees are diverse
- \* Advertised broadly to 1890, 1994, and Hispanic-serving Institutions: receive announcements of temporary and permanent positions
- \* Tracking systems includes gender and race/ethnicity search data
- \* UMES and UMCP Extension pooled resources to fund a full-time position for a bi-lingual Hispanic Program assistant on the Eastern shore; resulted in award for work with diverse state residents

##### Compliance and Diversity Initiative Activities

1. Activities and seminars about developing more accurate metrics and increasing the accuracy of reporting on compliance and diversity activities
2. Workshops focused on the challenges of change and transition as part of becoming a more diverse organization
3. Multiple self-assessment instruments in training seminars to enable participants to better understand themselves and their reactions to "differences," "change," and "leading change"
4. Focus is on enhancing the meaningfulness of compliance activities by developing clearer linkages to organization's mission and work, based on a new Affirmative Action Plan accepted by USDA CSREES in January 2004.
5. Pilot project implementation of a Limited English Proficiency Policy for which MCE was recognized as a model by the USDA Civil Rights Office.

#### 2002-2003 MCE Training Participation Related to Diversity Management

White	AfAmer	NatAmer	Asian	Hisp	N/R*		Male	Female	Total
423	80		1	3	103*		158	452	610
69%	14%				17%		26%	74%	100%

\*MCERS sessions conducted in counties (Maryland Cooperative Extension Reporting System)

##### Training included a total of sixty-two sessions of these titles:

- "Interpreting and Using MCERS Reports to Implement the Affirmative Action Plan"
- "How to Use Maryland Relay as an Accommodation for People with Disabilities"
- "Initiating Programs in Diverse Communities"
- "UNIV 100:Personal Style" (Personality Type and Self-Management for students)
- "Personal Style and Influence" and "Managing Up" (including bias based on type)
- "EEO Advisor Essentials" (Program and employment discrimination training)
- "Federal Compliance Review Preparation for 4-H Faculty and Staff"

“Central Civil Rights File”  
“Mastering the Change Curve”  
“Leading Change at Every Level”

## **Part B. Stakeholder Input Process**

### **University of Maryland at College Park, MD**

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.provost.umd.edu/Strategic\\_Planning/](http://www.provost.umd.edu/Strategic_Planning/)

For the College: <http://www.agnr.umd.edu/FacultyStaff/index.cfm?Parent=173&ID=292>

#### **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. This is a transition year between "Outcomes 2002" and the new "MCE Strategic Plan for 2008."

#### **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 "MCE Strategic Plan for 2008" and will be fully implemented in 2004.

### 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.

## University of Maryland Eastern Shore at Princess Anne, MD

### Stakeholder Advisory Council

The plant and soils, and portions of the animal science research units of the UMES Agricultural Experiment Station have chosen the area of *nutrient management and environmental stewardship* as a major focus area. As such, our stakeholder input process includes establishing a Stakeholder Advisory Council composed of researchers, educators, poultry producers on the Delmarva Peninsula, The Maryland Department of Agriculture, Chesapeake Bay Foundation, and at least two row crop farmers. This group will provide critical feedback, and assists in planning our research efforts to better serve the needs of the community relative to nutrient management. The committee will meet annually during an annual symposium which will be held at UMES each year.

The first such symposium and meeting of the **Stakeholder Advisory Council** is scheduled for August 8-9, 2004. This symposium will provide an excellent opportunity for the students at UMES to be exposed to applied environmental science, enable students to share in and critique scientist research, and work with scientists and land managers in the region to address environmental and economic challenges of various problems associated with nutrient management landscapes.

**Somerset County Soil Conservation District (SCSCD):** a partnership has been established with SCSCD to assist UMES in planning and achieving objectives relative to agricultural research. Several members of this association also belong to the above given advisory Council. A joint publication was produced in December, 2003 titled "*Managing Drainage Ditches to Reduce Nutrient Loss.*" This organization has assisted us in securing various stakeholder audiences for us to present our research objectives and secure input and assistance.

UMES' Agribusiness Advisory Council which previously focused its efforts on providing advice and counsel to the Dean and faculty on matters pertaining to the department's mission, goals, and strategic planning, is being reconstituted to focus primarily on the new Ph.D. program in Food Science and Technology.

### **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. The University of Maryland Eastern Shore School of Agricultural and Sciences (SANS) and the Ag Experiment Station follows the merit review procedures utilized by the University.

#### **Local Program Reviews**

Each MCE Extension Educator is required to develop or update an Individual Extension Plan (IEP also called a Job Description in some MCE documents) each year. These IEP's are updated annually and reviewed internally by Region Extension Directors and State Program Leaders for 4-H Youth Development; Family and Consumer Sciences; and Agriculture and Natural Resources. IEPs 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. Focus Teams, consisting of multi-disciplinary faculty, were developed in 2003 to facilitate priority programming. 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.*

UMES' Ag Experiment Station conducted a three-day strategic planning workshop for Agriculture and Human Ecology faculty last January. The outcome- an updated strategic plan produced from this meeting is being used to guide the research and teaching activities of these departments. At the encouragement of the workshop facilitators, collaborative initiatives with other units external to SANS are being involved in activities that can enhance research and teaching activities in SANS. Two major initiatives are underway focusing on technology and food safety.

In addition to the strategic planning document mentioned above, each unit in SANS submits individual faculty goals and objectives and departmental goals and objectives every year. These goals are linked with the Schools and are reviewed annually.

Recently, the University began revising its strategic plan and implemented a new program review procedure. This process will be completed April 20<sup>th</sup> and will allow each department and SANS to determine its strengths and weaknesses. Human Ecology's dietetics program and family and consumer sciences teacher education program, along with agriculture education underwent reviews by their respective accrediting bodies in October and November 2003. No significant changes are expected for these programs.

Program reviews will also be conducted in 2005 by CSREES for Agriculture and Human Ecology programs.

#### **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 scientists to assess the proposed research plans.

### **External Review of Departments**

*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 1998. 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. The Dietetics Review has been completed and a meeting held February 2004 with the Acting Dean of the College, however, a decision has not yet been announced. The Department of Nutrition and Food Science and Department of Veterinary Medicine are due for external reviews in 2005. In 2006 Department of Agricultural and Resource Economics will participate in an external review.*

## **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.*

Given below is a list of on-going multi-state joint research projects at the UMES Agricultural Experiment Station with collaborating units that fall under POW goals:

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

**1. Characterization of Antibiotic-Resistant *Salmonella* spp. Isolated from Processed Poultry**

Collaborators: USDA/ARS Microbial Food Safety Research Unit, UMES

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

- 0. Using fertilizer trials to assess the fate of N in a coastal plain landscape**
- 2. Role of sediments in mediating phosphorus transport of coastal plain ditches**
- 3. Gypsum to reduce soluble and particulate P transport plots**
- 4. Relationship of ditch water quality to field overland/subsurface flow**
- 5. Evaluation of alternative ditch management methods**

**6. Survey of ditch sediment properties on UMES research farm**

**7. Modeling nutrient transport from field and ditches**

**8. N and P manure management plots**

Collaborators: *USDA-ARS, University Park PA, University of Maryland College Park, and the Maryland Department of Natural Resources*

**9. Mediating Exposure to Environmental Hazards through Textile Systems (NC170)**

Collaborators: *Cornell University, University of Illinois Urbana Champaign*

**10. Reduction in Animal Waste Pollution through the Use of Enzymes to improve phosphorus digestion**

Collaborators: *UMCP- USDA-ARS & Rutgers*

## 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:  Multi-state Extension Activities  
 Integrated Activities (Evans Allen)  
 Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	Actual Expenditures			
	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>
Goal 1 - To Achieve an Agricultural production system that is highly competitive in the global economy	<u>\$295,994</u>	<u>\$288,928</u>	<u>\$290,209</u>	<u>\$293,111</u>
Goal 2 - A safe, secure food and fiber system	<u>\$35,307</u>	<u>\$34,674</u>	<u>\$38,676</u>	<u>\$39,000</u>
Goal 3 - A healthy, well-nourished population	<u>\$116,272</u>	<u>\$117,051</u>	<u>\$129,388</u>	<u>\$130,700</u>
Goal 4 - Achieve greater harmony (balance) between agriculture and the environment	<u>\$213,177</u>	<u>\$209,115</u>	<u>\$210,181</u>	<u>\$212,300</u>
Goal 5 - Enhanced economic opportunity and quality of life for Americans	<u>\$110,974</u>	<u>\$113,292</u>	<u>\$113,528</u>	<u>\$114,600</u>
Total	<u>\$771,724</u>	<u>\$763,060</u>	<u>\$781,982</u>	<u>\$789,900</u>
			_____ Director	_____ April

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 (Evans Allen)  
 Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	Actual Expenditures			
	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>
<u>Goal 1 - To Achieve an Agricultural production system that is highly competitive in the global economy</u>	<u>\$438,858</u>	<u>\$433,593</u>	<u>\$412,174</u>	<u>\$412,700</u>
<u>Goal 2 - A safe, secure food and fiber system</u>	<u>\$27,460</u>	<u>\$25,588</u>	<u>\$23,326</u>	<u>\$23,326</u>
<u>Goal 3 - A healthy, well-nourished population</u>	<u>\$41,190</u>	<u>\$38,382</u>	<u>\$34,989</u>	<u>\$35,000</u>
<u>Goal 4 - Achieve greater harmony (balance) between agriculture and the environment</u>	<u>\$270,438</u>	<u>\$268,683</u>	<u>\$227,364</u>	<u>\$227,600</u>
<u>Goal 5 - Enhanced economic opportunity and quality of life for Americans</u>	<u>\$2,296</u>	<u>\$2,296</u>	<u>\$2,411</u>	<u>\$2,411</u>
Total	<u>\$780,242</u>	<u>\$768,543</u>	<u>\$700,264</u>	<u>\$701,200</u>
		_____ Director		_____ Ap

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 (Evans Allen)  
 Integrated Activities (Smith-Lever Act Funds)

Actual Expenditures

Title of Planned Program/Activity	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>
<u>Goal 1 - To Achieve an Agricultural production system that is highly competitive in the global economy</u>	\$470,142	\$468,717	\$458,711	\$488,200
<u>Goal 2 - A safe, secure food and fiber system</u>	\$27,324	\$24,430	\$23,680	\$25,200
<u>Goal 3 - A healthy, well-nourished population</u>	\$40,986	\$36,645	\$35,521	\$37,800
<u>Goal 4 - Achieve greater harmony (balance) between agriculture and the environment</u>	\$226,613	\$228,107	\$201,381	\$214,300
<u>Goal 5 - Enhanced economic opportunity and quality of life for Americans</u>	\$7,348	\$7,715	\$7,715	\$8,200
Total	\$772,413	\$765,614	\$727,008	\$773,700

\_\_\_\_\_  
 Director

Form CSREES-REPT (2/00) Facsimile