

**V(A). Planned Program (Summary)**

**Program # 1**

**1. Name of the Planned Program**

Global Food Security and Hunger

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%	10%	15%	20%
205	Plant Management Systems	10%	10%	10%	20%
216	Integrated Pest Management Systems	15%	10%	10%	15%
311	Animal Diseases	10%	10%	10%	10%
503	Quality Maintenance in Storing and Marketing Food Products	5%	10%	5%	0%
601	Economics of Agricultural Production and Farm Management	10%	10%	10%	15%
602	Business Management, Finance, and Taxation	10%	10%	10%	0%
604	Marketing and Distribution Practices	10%	10%	10%	0%
608	Community Resource Planning and Development	10%	10%	10%	10%
704	Nutrition and Hunger in the Population	10%	10%	10%	10%
	<b>Total</b>	100%	100%	100%	100%

**V(C). Planned Program (Inputs)**

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	38.0	6.0	20.0	6.0
Actual	24.0	4.0	16.0	4.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
987605	394824	829559	432665
1862 Matching	1890 Matching	1862 Matching	1890 Matching
987605	394824	829559	432665
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1975210	789648	1621148	865331

## V(D). Planned Program (Activity)

### 1. Brief description of the Activity

**Integrated Pest Management (IPM):** Sixty two percent of the commercial MD greenhouses are actively participating in TPM/IPM programs with hired professional scouts or using Extension trained personnel to monitor their crops. UMES research is focused on protective clothing for pesticide applicators.

**Invasive species:** UME focused on control strategies for the brown marmorated stink bug to minimize crop losses. A field and laboratory study was conducted at UMES to: (i) Isolate indigenous spore-forming bacteria expressing delta-endotoxins with Bt comparable potential as bio-insecticides; (ii) Determine host plant interaction through foliage defoliation; and (iii) Assay the relative importance of genotype x insect interaction.

**Animal health and Biosecurity:** UME provided small flock owners biosecurity training and supplied them with tools to help prevent, control, or respond to avian disease outbreak. UMES research is examining the impact of possible natural anthelmintics on meat quality in sheep and goats. MAES research focused on investigating knowledge gaps in the pathogenesis and recurrence of infectious laryngotracheitis (ILT) on the Delmarva Peninsula; engineering a novel vaccine that protects both infectious laryngotracheitis and Newcastle disease.

**Rural Community Resource & Economic Development:** The Maryland Rural Enterprise Development Center (MREDC) provided programs in 1) Mastering Marketing and, 2) Curbside Consulting for business development and market planning.

**Small Farm Outreach:** The annual small farm conference was held to inform about new farming techniques, direct marketing opportunities, and strategies to increase profitability and sustainability. The Small Landowner Forestry and Conservation field tours on the Lower Eastern Shore educate farmers about forest resource management strategies and cost-share/conservation programs available.

**Alternative Agriculture Crops:** Approximately 2,360 producers attended educational workshops and twilight tours on alternative crops and 534 on organic crops.

**Urban Food Production:** The Grow it Eat it program has created GIEI teams in 15 counties and Baltimore City to help homeowners with backyard food production.

**Nutrient Management:** UME advisors have written 620 new traditional nutrient management plans and updated 4,190 plans along with 74 manure transport plans. Twenty-seven workshops were held and 545 nutrient management consultants were trained.

**Crop Production:** UMES research addressed the development and implementation of a multimicrobial and multifunctional inoculant for enhancing soybean productivity and environmental quality and introducing a cowpea as a crop to ensure food security, sustainable crop production, and water quality. MAES research focused on developing genomic and genetic resources for a diploid strawberry; identifying problem weeds, studying the biology of these weeds, and determining optimum way to manage weeds to reduce their impact on crop production; developing cost-effective sensor network tools that will

enable farmers to make better irrigation management decisions; assessing and identifying the diversity of specific groups of fungi associated with woody trees.

## 2. Brief description of the target audience

**Integrated Pest Management:** Crops: Crop scouts; Certified Crop Advisors; Chemical reps; Industry personnel; Extension faculty; Master Gardeners; Farmers. Green Industry: Arborist, landscape managers, professional ground managers, greenhouse growers, cut flower growers, homeowners, Master Gardeners; Agency personnel (MDA, UME, USDA); Certified pesticide applicators in categories III, IV, V; Private pesticide applicators; Technicians; Undergraduate and Graduate students; General public (e.g. Master-gardeners); IPM consultants; Landscape architects; Community Gardeners; Builders and Developers; Municipalities; Federal, state & local agencies; Scientific Community.

**Invasive species:** Crops: Crop scouts; Certified Crop Advisors; Chemical reps; Industry personnel; Extension faculty; Master Gardeners; Farmers. Green Industry: Arborist, landscape managers, professional ground managers, greenhouse growers, cut flower growers, homeowners, Master Gardeners; Agency personnel (MDA, MCE, USDA); Technicians; Undergraduate and Graduate students; General public (e.g. Master-gardeners); IPM consultants; Landscape architects; Community Gardeners; Builders and Developers; Municipalities; Federal, state & local agencies; Scientific Community.

**Rural Community Resource & Economic Development:** Southern Maryland Agricultural Development Commission; MARBIDCO; Chesapeake Fields; Garrett-Preston Rural Development Association; Rural Development Center at UMES; Local Agricultural Development Specialists; Planning and Zoning Boards; Farmers; Forest Landowners; General public; Food processors; Producers; Growers; Grain marketing clubs; Farmers markets; Local economic development offices; Mid-Atlantic Direct Marketing Association. Youth audiences and 4-H volunteers carry out entrepreneurship focused projects within urban agriculture. County agricultural marketing specialists; Farmer markets, Farmers; Maryland citizens; Local economic development offices.

**Small Farm Outreach:** Aspiring farmers, producers, landowners.

**Animal health and biosecurity:** Farmers; youth; MDA; Agricultural industry; Small and Beginning farmers; Backyard livestock owners; Extension faculty; Research faculty; and the Scientific Community. Students (undergraduate and graduate); stakeholder farmers; additional state and federal collaborators

**Alternative agriculture crops:** Producers; Transitional farmers; New &/or beginning farmers; Farmers markets; Local restaurants; MARBIDCO; County agricultural marketing specialists; Maryland Department of Agriculture; National Colonial Farms; and the Scientific Community. Commercial plant growers, plant breeders, retailers, and local home gardeners

**Urban food production--Grow It Eat It (GIEI) program:** General public; retailers; local home gardeners; schools and other K-12 educational programs; 4-H youth; Master Gardeners; local restaurants; community gardeners; local government officials interested in "greening" of urban areas; small farmers.

**Nutrient Management:** Individual landowners; agribusinesses; horse owners; dairy farmers; beef producers; sheep and goat producers; USDA conservationists.

**Crop Production:** Individual landowners, small and large agricultural operations, Extension faculty, and scientific community.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	54000	100000	300	0
<b>Actual</b>	542427	1950300	392	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2010

Plan: 0

Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
<b>Plan</b>	6	40	
<b>Actual</b>	56	83	139

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- 1. IPM: Fact sheets; short courses, field trials, curriculum, websites linked, grants awarded.

Year	Target	Actual
2010	35	22

**Output #2**

**Output Measure**

- 2. Community Resource & Economic Development: Publications; advisory committees, new enterprises, relationships, laws, programs, curriculum

Year	Target	Actual
2010	40	40

**Output #3**

**Output Measure**

- 3. Biosecurity and Animal Health: In-service training, seminars, publications, grants, presentations, websites linked.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	32	44

**Output #4**

**Output Measure**

- 4. Pasture Management: Pasture walks, variety trials, in-service training, grants, publications, budgets, practices implemented, websites & workshops

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	25	53

**Output #5**

**Output Measure**

- 5. Family Financial Management: Number Workshops, seminars, publications, in-service training, volunteers trained, partnerships, new enterprises, grants.  
Not reporting on this Output for this Annual Report

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	1. IPM: Number of IPM scouts and producers that can identify threshold level; pest management programs; implementing research based recommendations; certification in <u>Pesticide Safety</u> ; field trails.
2	2. Community Resource & Economic Development: Number of business people, advisory groups, development agencies, rural leaders interested in developing ANR businesses and having access to knowledge; Favorable policies created to encourage AGNR enterprises; New AGNR businesses established; Business and marketing plans developed; Number of Communities integrating MCE information for land use decisions and improved growth management concepts; Pubs developed and used to make land use decisions; and Regional collaborations
3	3. Bio-security and Animal Health: Number of: educational seminars held for producers, allied industry personnel and government workers; number of producers implementing biosecurity measures; new training curriculum developed.
4	4. Pasture Management: Number of: farmers adopting best management practices and increasing profitability; new variety trails; Extension, NRCS and SWCD personnel trained; new practices recommended
5	5. Family Financial Management: Number of: volunteers trained; new partnerships developed; new enterprises; Number who: comparison shop for best credit terms; pay more than minimum on credit cards; pay credit card bills on time; reduce their debt; develop/review estate plan; track family income and spending; develop a spending plan/budget.
6	6. Urban Agriculture: # of participants in urban gardening food production classes, seminars, programs, trainings; # of participants in urban forestry classes, seminars, programs, trainings,

## **Outcome #1**

### **1. Outcome Measures**

1. IPM: Number of IPM scouts and producers that can identify threshold level; pest management programs; implementing research based recommendations; certification in Pesticide Safety; field trails.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research
- 1890 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	1000	1320

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Nursery, greenhouse and landscape management is Maryland's second largest agricultural industry (valued at \$1.96 billion in 2007). This industry requires cost-effective and environmentally safe materials and methods to control insects and diseases and to efficiently use water and nutrients. The IPM program was developed to help Maryland greenhouse and nursery managers stay on top of current insect, disease and fertility problems with greenhouse crops and to sustain and expand the use of IPM techniques.

#### **What has been done**

UME faculty conducted over 150 educational programs reaching over 9,000 people. Sixty two percent of the commercial MD greenhouses are actively participating in TPM/IPM programs with hired professional scouts or using Extension trained in-house personnel to monitor their crops.

#### **Results**

Through educational efforts we have convinced 7 greenhouse operations to install microscreening on newly constructed greenhouse, which greatly reduces the outdoor inward migration of insect pests. As a result of participation in TPM/IPM programs we have reduced pesticide applications by 45 -50% compared to years previous to participation in the program.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
216	Integrated Pest Management Systems

## **Outcome #2**

### **1. Outcome Measures**

2. Community Resource & Economic Development: Number of business people, advisory groups, development agencies, rural leaders interested in developing ANR businesses and having access to knowledge; Favorable policies created to encourage AGNR enterprises; New AGNR businesses established; Business and marketing plans developed; Number of Communities integrating MCE information for land use decisions and improved growth management concepts; Pubs developed and used to make land use decisions; and Regional collaborations

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research
- 1890 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	290	1906

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Surveys of rural communities indicate an overwhelming need for education programs in financial issues, business planning, sustainable agriculture, entrepreneurship, value-added, alternative enterprises/crops, land use planning, farm profitability and support for small and beginning farmers, rural-urban interface conflicts and AGNR marketing.

#### **What has been done**

The Maryland Rural Enterprise Development Center (MREDC) is a new on-line Extension initiative providing farmers, agricultural entrepreneurs, and new and beginning farmers a much needed resource. The Curbside Consulting has provided one on one consultation for business development and market planning.

#### **Results**

Thirty-nine Curbside Consultations have been performed. As a result of direct marketing programs, attendees have increased understanding of the components of different direct markets outlets, the opportunities and threats involved in pursuing any of these outlets, contact information for different outlets, and the profit potential for each.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
503	Quality Maintenance in Storing and Marketing Food Products
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
608	Community Resource Planning and Development

### **Outcome #3**

#### **1. Outcome Measures**

3. Bio-security and Animal Health: Number of: educational seminars held for producers, allied industry personnel and government workers; number of producers implementing biosecurity measures; new training curriculum developed.

#### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

#### **3a. Outcome Type:**

Change in Action Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	80	69

#### **3c. Qualitative Outcome or Impact Statement**

##### **Issue (Who cares and Why)**

Poultry and egg production is Maryland's largest agricultural industries worth nearly \$1 billion in 2007. A disease outbreak such as Avian Influenza (AI) or exotic Newcastle disease in Maryland's poultry would economically impact poultry growers and processors, and in the case of H5 or H7 AI, would present potential human health risks. These diseases can cause epidemics on poultry farms, loss of export markets, and long expensive quarantines, resulting in large financial losses.

##### **What has been done**

This work in biosecurity and animal health provided small flock owners access to biosecurity training geared toward their needs, and supplied them with the tools and resources to help them prevent, control, or rapidly responds to any avian disease outbreak. Approximately 41 publications were developed in disease identification, vaccine development and biosecurity.

##### **Results**

Biosecurity workshops, and educational material such as fact sheets and web-based materials, have led to better AI prevention and control measures. It is estimated these programs have saved

the industry millions of dollars in losses.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
311	Animal Diseases

#### Outcome #4

##### 1. Outcome Measures

4. Pasture Management: Number of: farmers adopting best management practices and increasing profitability; new variety trails; Extension, NRCS and SWCD personnel trained; new practices recommended

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	250	251

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

The dairy industry is important to Maryland agriculture because it produces about \$200 million in gross receipts for Maryland's economy. Urban sprawl leads to high land values, placing added pressures for decreasing farmland and increasing scrutiny on environmental issues such as water and air quality. Our farmers must become efficient in reduced labor cost, reduced feed cost, and increased revenues from value-added products to have profitability.

###### **What has been done**

Utilized results of applied research and farm demonstrations to prepare teaching materials for seminars, pasture walks, farm consultations, newsletter articles, and newspaper column.

###### **Results**

Ninety-seven dairy and livestock producers from the Tri-State area participated in pasture walks through which they learned improved management techniques for selecting and implementing alternatives in forage production and feed management systems. Four farms have continued in a grant funded program to convert a total of 200 acres of crop land into pasture. In addition one-hundred sixty four small and part-time farmers learned new pasture management techniques.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management

#### Outcome #5

##### 1. Outcome Measures

5. Family Financial Management: Number of: volunteers trained; new partnerships developed; new enterprises; Number who: comparison shop for best credit terms; pay more than minimum on credit cards; pay credit card bills on time; reduce their debt; develop/review estate plan; track family income and spending; develop a spending plan/budget.

Not Reporting on this Outcome Measure

#### Outcome #6

##### 1. Outcome Measures

6. Urban Agriculture: # of participants in urban gardening food production classes, seminars, programs, trainings; # of participants in urban forestry classes, seminars, programs, trainings,

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	11920

##### 3c. Qualitative Outcome or Impact Statement

###### Issue (Who cares and Why)

Interest in home and community food production has grown over the past two years in Maryland due to the 2008 recession, and a growing public desire for locally grown foods. Less than 30% of adult Marylanders consume five servings of fruits and vegetables each day. Many Marylanders desire fresh, locally grown vegetables, either to purchase or to grow themselves, but lack the space, time, or knowledge to create and maintain a garden of their own.

### **What has been done**

UME Master Gardeners have taught 337 Grow It, Eat It classes and trained over 7,200 people. The GIEI program has developed the University of Maryland Salad Tables and Salad Boxes to help homeowners with backyard food production.

### **Results**

The 4,719 residents who took vegetable gardening classes saved approximately \$290,000 on food because of their gardens. Training programs and participants estimated they have reached 14,000+ people with information on Salad Tables and Salad Boxes; 679 Salad Tables and 956 Salad Boxes had been constructed and used as a result.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
704	Nutrition and Hunger in the Population

## **V(H). Planned Program (External Factors)**

### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

### **Brief Explanation**

Overall, we have been able to meet our strategic goals through the use of Impact Teams and more focused programs. We are also doing a better job at reporting impacts.

A strategic staff plan has been developed for UME that focuses on providing adequate geographic and programmatic coverage of tenure-track educators and faculty educator assistants. On the producer side, input costs continue to rise, such as fuel, oil, seed, fertilizer and electricity. There is also the continuing unsteady commodity market and depressed economy in the nation and state that have made it difficult for the farming community to be profitable.

The interest in alternative energy sources has continued growing as the price of oil and gas goes up and disasters have occurred, such as the oil spill in the Gulf. Interest continues in alternative and high value crops.

Research related to food security in terms of efficient, economic, and environmentally sustainable production produced more than 100 refereed publications with novel outcomes related to crop and animal genomics, animal and plant diseases, value added nutritional crop products, vaccine development, and economic analysis of the production.

## **V(I). Planned Program (Evaluation Studies and Data Collection)**

### **1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

### **Evaluation Results**

Specific results are reported in the state defined outcomes. The key items section contains highlighted results.

### **Key Items of Evaluation**

**IPM:** As a result of participation in TPM/IPM programs we have reduced pesticide applications by 45 -50% compared to years previous to participation in the program. A written survey of the 59 growers showed that 86% felt they improved their understanding of diseases, insects and nutrient management monitoring techniques. Seventy nine percent felt they improved their ability to correctly select the least toxic fungicide or insecticide to control greenhouse insect and disease. Ninety-five percent felt they could now correctly calibrate a fertilizer injector and understood how to use a pH and soluble salt meter to monitor nutrient and pH levels in their greenhouse soils. Sixty two percent of the commercial MD greenhouses are actively participating in TPM/IPM programs with hired professional scouts or using Extension trained in-house personnel to monitor their crops.

**Alternative Agriculture Crops:** Approximately 2,360 producers attended educational workshops and twilight tours on alternative crops and 534 on organic crops. Surveys of organic crops events indicated 85% improved their knowledge on weed control options, 100% increased knowledge of tillage effects on weed species populations, 50% increased knowledge on using a commercial source of compost, 62% increased knowledge on using a flamer to control weeds and 62% increased knowledge on using biological control for insect management.

**Urban Food Production:** The 4,719 residents who took vegetable gardening classes saved approximately \$290,000 on food because of their gardens. The GIEI program has developed the University of Maryland Salad Tables™ and Salad Boxes™ to help homeowners with backyard food production. Training programs and participants estimated they have reached 14,000+ people with information on Salad Tables™ and Salad Boxes™; 679 Salad Tables™ and 956 Salad Boxes™ had been constructed and used as a result.

**Nutrient Management:** To help protect the Chesapeake Bay, UME advisors have written 620 new traditional nutrient management plans and updated 4,190 plans along with 74 manure transport plans. Twenty-seven workshops were held and 545 nutrient management consultants were trained and issued required continuing education credits.

Eighty three farmers were trained to write their own plans.

**Environmental Stewardship:** Programming on well and septic maintenance led to 50% of participants saving money ranging from \$100 to \$15,000 with an average of \$4,700.