

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Global Food Security and Hunger

Reporting on this Program

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	12%	11%	12%	6%
111	Conservation and Efficient Use of Water	2%	3%	2%	1%
112	Watershed Protection and Management	4%	5%	4%	3%
121	Management of Range Resources	1%	0%	1%	0%
125	Agroforestry	0%	0%	1%	0%
131	Alternative Uses of Land	0%	8%	0%	4%
133	Pollution Prevention and Mitigation	5%	6%	4%	3%
201	Plant Genome, Genetics, and Genetic Mechanisms	27%	0%	26%	0%
204	Plant Product Quality and Utility (Preharvest)	11%	0%	13%	0%
205	Plant Management Systems	18%	0%	18%	0%
216	Integrated Pest Management Systems	6%	0%	4%	0%
301	Reproductive Performance of Animals	1%	0%	1%	0%
303	Genetic Improvement of Animals	1%	0%	1%	23%
304	Animal Genome	0%	0%	0%	7%
307	Animal Management Systems	5%	22%	6%	22%
311	Animal Diseases	0%	13%	0%	0%
403	Waste Disposal, Recycling, and Reuse	0%	2%	0%	1%
503	Quality Maintenance in Storing and Marketing Food Products	4%	0%	4%	0%
601	Economics of Agricultural Production and Farm Management	3%	30%	2%	16%
701	Nutrient Composition of Food	0%	0%	1%	14%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Extension	Research
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Year: 2013	1862	1890	1862	1890
	Plan	59.5	1.5	42.0
Actual Paid Professional	33.7	2.2	32.6	10.8
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
3501950	686984	3341318	1328864
1862 Matching	1890 Matching	1862 Matching	1890 Matching
3501950	686984	3341318	1328864
1862 All Other	1890 All Other	1862 All Other	1890 All Other
30956290	0	42147678	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

This planned program encompasses the largest area of combined research and Extension work for UGA and FVSU. Below are highlights of work done on select projects.

New scientific information was made available to scientific peers through the publication of original research articles in scientific journals. More applied knowledge was disseminated to the audience at large by publishing results in journal articles, Extension bulletins, and departmental research reports and by coordinating presentations with Extension personnel.

Research continues on:

- Cattle- Offered the Master Cattlemen's Program.
- Pesticides- Provided updates on pest control and Georgia Pest Management Handbook and estimations of pest losses in livestock and dairy.
- Pecans - Seedlings have begun to fruit and are being selected for nut quality and monitored for quality and pest resistance. Phone hotline was maintained.
- Fungicide Resistance - Developed effective disease management programs that minimize the development of fungicide resistance in many crops. New active ingredients of chemical fungicides have been evaluated. Field experiments have been conducted on the efficacy of biological and chemical.
- Species-specific primers were developed for detection. Fungicide programs were developed over a 3-year period in field trials in Mexico. The small grains team released four new wheat varieties with disease

and insect resistance.

- Blueberries - Detected pathogens, overwintering, and yield loss relationships. Evaluated natural detachment of mature fruit and various genotypes evaluated. Demonstrated the benefits of appropriate cultural methods.
- Veterinary entomology - Provided mandated certification. Worked with GA DNR and EPD as expert advisors.
- Agribusiness, sustainability, and economic development - Information on social capital, education, and poverty is being collected and provided to policy makers, industry and the public. Researched agricultural management and marketing. Researched production and management alternatives in a variety of crop and cattle enterprises.
- Plant disease - Conducted research projects, field experiments, and screenings on plant disease management and developed management programs to reduce losses. Improved management of seedborne disease.
- Goat and sheep - Trained National Guard troops prior to deployment to Afghanistan. Developed info on parasites and general small ruminant management techniques. Conducted on-farm research and station studies.

2. Brief description of the target audience

The target audience is sheep, goat, beef & pork producers, dairymen, county agents, veterinarians, and industry professionals.

3. How was eXtension used?

There are currently 7 leaders and 68 active members associated Communities of Practice related to this planned program.

The membership in **eXtension** has continued to grow. Overall, there are currently 195 members in Communities of Practice in 62 approved communities. (Up from 150 members in 59 communities in 2012)

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	846380	726020	117706	100968

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

Year: 2013

Actual: 20

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	380	18	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of significant publications including articles, bulletins and extension publications. (excluding peer reviewed articles)

Year	Actual
2013	92

Output #2

Output Measure

- Number of educational contact hours generated from formal educational programs presented to county extension agents by state faculty directly associated with this planned program.

Year	Actual
2013	25

Output #3

Output Measure

- Number of educational contact hours generated from formal educational programs presented directly to clientele by state faculty directly associated with this planned program.

Year	Actual
2013	40330

Output #4

Output Measure

- Number of invited presentations by faculty directly resulting from the success of this planned program.

Year	Actual
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2013 90

Output #5

Output Measure

- Number of disease samples processed by diagnostic laboratory.

Year	Actual
2013	8546

Output #6

Output Measure

- Number of field experiments to develop disease management approaches.

Year	Actual
2013	18

Output #7

Output Measure

- Number of international contacts

Year	Actual
2013	85

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of additional direct extension contacts made by county faculty not receiving federal funds, staff or volunteers as a direct result of the work of faculty receiving federal funds within this planned program.
2	Number of Master Cattlemen certifications granted through this planned program.
3	Increase in the farm gate value of livestock production in Georgia. Reported in millions of dollars.
4	Farm gate value of poultry production in Georgia. Value reported annually in millions of dollars.
5	Medium term: development of disease management approaches the reduce disease damage by 65%

Outcome #1

1. Outcome Measures

Number of additional direct extension contacts made by county faculty not receiving federal funds, staff or volunteers as a direct result of the work of faculty receiving federal funds within this planned program.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	920997

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Faculty associated with federal funds also make indirect contacts to clientele. These federally funded positions provide further impact to the community through county faculty, staff and volunteers not receiving federal funds. This county level programming results in thousands of additional direct Extension contacts.

What has been done

County faculty have presented research based information directly to clientele through presentations, workshops, on-site visits, meetings, and other trainings.

Results

UGA Extension extended lifelong learning to the people of Georgia through unbiased, research-based education.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
121	Management of Range Resources

125	Agroforestry
131	Alternative Uses of Land
133	Pollution Prevention and Mitigation
201	Plant Genome, Genetics, and Genetic Mechanisms
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
304	Animal Genome
307	Animal Management Systems
311	Animal Diseases
403	Waste Disposal, Recycling, and Reuse
503	Quality Maintenance in Storing and Marketing Food Products
601	Economics of Agricultural Production and Farm Management
701	Nutrient Composition of Food

Outcome #2

1. Outcome Measures

Number of Master Cattlemen certifications granted through this planned program.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	110

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Every one of Georgia's 159 counties has cattle. Georgia cattle producers need educational opportunities that will help them apply research based techniques to their herds.

In order for Georgia cattle producers to be economically viable they must stay abreast of

economic and environmental conditions which have a direct impact on production and profit. Effort must be made by producers to increase production and management efficiency, thus it is important that as educators we help keep cattle producers current on the latest production and management information. Georgia cattle producers seek educational opportunities that will help them apply new innovative management techniques to their herds.

What has been done

Over twenty years ago, the UGA Animal and Dairy Science Department developed an intensive cattle production program for producers known as the Georgia Master Cattlemen's Program. Over the years the program has been modified to meet changes in production methods and environmental concerns and/or issues.

Georgia Master Cattlemen's Program was held at the Georgia County Extension Office regularly. The educational effort consisted of classes on nutrition, facilities, forages, economics/marketing, foreign animal diseases, agro-terrorism, general herd health, external parasites, reproduction, Beef Quality Assurance Certification, sire selection, record keeping and the benefit of being a member of the Georgia Cattlemen's Association. The educational programs are taught by Extension Specialists and county agents.

Results

A total of 110 producers received Master Cattleman certification.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management
701	Nutrient Composition of Food

Outcome #3

1. Outcome Measures

Increase in the farm gate value of livestock production in Georgia. Reported in millions of dollars.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	257354865

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Poultry production is one of Georgia's largest agricultural industry, and agriculture is Georgia's largest industry.

What has been done

A survey of Georgia Cooperative Extension county agents and commodity specialists was conducted for the purpose of providing annual county-level information for the value of all food and fiber commodities grown in the state.

Results

The Farm Gate value of poultry showed an increase of 4.7%

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management
701	Nutrient Composition of Food

Outcome #4

1. Outcome Measures

Farm gate value of poultry production in Georgia. Value reported annually in millions of dollars.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	257354865

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management
701	Nutrient Composition of Food

Outcome #5

1. Outcome Measures

Medium term: development of disease management approaches the reduce disease damage by 65%

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	60

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The profitable and sustainable production of vegetables in Georgia is severely impacted by a number of diseases. Among which Phytophthora blight, southern blight, Fusarium wilt, gummy stem blight, and downy mildew are the most destructive and most difficult to control.

What has been done

Studies have been conducted to develop effective management programs to reduce losses caused by vegetable diseases.

In field studies, the new fungicides applied alone or in conjunction with other selected fungicides were demonstrated to be among the most effective in reduction of Phytophthora blight.

A series of field experiments have been conducted to determine the efficacy of biological and chemical fungicides for control of southern blight on tomato caused by *Sclerotium rolfsii*.

Results

Experiments with disease management approaches proved a 60% reduction in crop damage.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems

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

Heavy summer rainfall led to high levels of pecan scab infection, which allowed us to screen populations more effectively, but reduced quality in susceptible cultivars and selections. Wet weather also resulted in significantly more fungicide use in peanuts, pecans, and watermelons.

Removal of some pesticidal products from the market has reduced weapons in the pest control arsenal. Insecticide resistance continues to diminish the efficacy of existing products.

Regulations and the interpretation and enforcement of the rules is constantly evolving and impacting our programs. The high cost of inorganic fertilizer is positively influencing the value of animal manures and increasing off farm demand.

Constant fluctuation of animal feed ingredients has influenced changes in animal diets. The economy is also causing hardships for producers resulting in less funding available for on farm environmental improvements.

Stagnant incomes and personal spending, tight credit, a real state/foreclosure crisis, high unemployment, and a government focus on improving the economic situation continued in 2010.

Immigration is leading to issues of financial literacy and access to credit.

Volatile input and commodity prices continued to affect industry performance.

Case studies were conducted for particular agribusiness operations and ventures. Extension personnel observed agribusiness performance as they worked one-on-one with growers. Financial success in this sector continues to be a challenge, particularly at the farm production level.

Although the drought conditions have lessened, weather variability continued to affect many producers in Georgia and public programs such as crop insurance are still being impacted, making it necessary to respond with improved risk management strategies. Also changes in public policy, particularly trade and farm bill legislation, needed responses.

Volatile output and input prices had to be addressed as well.

There is a continual risk for the introduction of exotic disease causing fungi into the U.S. Previous introductions include daylily and gladiolus rust fungi and the Asian soybean rust fungus. These introductions directly impact growers due to mandatory quarantine and eradication measures at great cost. Introductions also result in the need for basic and applied research on these pathogens.

Public policy on biofuel and impact on land use, food supply, and feed supply. Government regulations on meat inspection had an impact. Increase in target population and market brought higher demand. Marketing practice and opportunities are factors often cited by clients as challenges.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Multiple projects have occurred under this planned program. Below are a few highlights of evaluation findings from select projects.

- County agents and other stakeholders continue to request assistance through the program which indicates some level of satisfaction in the service they receive. GA Dept of Ag and EPD also continue to ask our / assistance in developing and implementing regulations. Commodity groups have shown great support and have frequently asked for our assistance with environmental issues and educational programs.
- Now that ten years of data has been collected on pecan cultivars, recommendations for improved disease resistance, greater genetic variability, and cultural attributes such as harvest date, regular bearing, and nut quality.
- Research found that *A.citrulli* quorum sensing contributes to seed-to-seedling transmission of bacterial fruit blotch. It was also found that commercial cucurbit seed represents a significant source of *A. citrulli* inoculum in China. Certain provinces in China present high risks for cucurbit seed contamination by *A. citrulli*.
- Lime sulfur, Indar, and Captan were found to be excellent fungicides for management of *Exobasidium*. Organic materials failed to manage mummy berry, whereas chemical fungicides provide excellent activity. Additional fungicides have been tested and found more effective than those recently utilized.
- The candidate gene for parthenogenesis was shown to express in the egg cell and induce fertilization-independent initiation of embryos from meiotically-reduced eggs.
- Biorational nematicides developed in this program have shown efficacy against plant-parasitic nematodes on fruit crops.
- Resistant line to FOS 1 and FOS 2 were identified and the selections made will form the basis for further breeding efforts for resistance to *Fusarium* wilt races 1 and 2 in watermelon. Mapping populations were created identify region associated with resistance.

- New knowledge has been gained regarding the point of mature fruit detachment and molecular aspects of fruit detachment. This information has potential implications for breeding of new blueberry varieties.
- Our integrated management research plots showed that successful production of blueberry on a replant site requires a combination of preplant treatment with nematicides, plastic mulches, and soil amendment with pinebark.
- Research progress has been made as scheduled and yearly objectives have been reached.
- Incorporation of resistance to rust fungi in winter wheat varieties provides long term management of diseases. The assessment of fungicide efficacy provides growers with broader choices to incorporate into an integrated disease management plan.
- With the number of fungicide applications required, recommendations helped offset the risk of fungicide resistance and direct losses due to plant disease.
- Row covers were found to be important during the first few weeks after planting squash to prevent squash bug invasion and the development of cucurbit yellow vine disease.
- Response to evaluation of Small Ruminant Toolbox training for Extension Educators were positive.

Key Items of Evaluation

- New chemical fungicides provided excellent activity
- GA Dept of Ag and EPD also continue to ask our / assistance in developing and implementing regulations.
- Recommendations helped offset the risk of fungicide resistance and direct losses due to plant disease
- Mapping populations were created identify region associated with resistance
- Ten years of data has been collected on pecan cultivars
- Small Ruminant Toolbox training were successful.