

Georgia
Annual Report of Accomplishments
FY 2003

The University of Georgia
College of Agricultural and Environmental Sciences
Cooperative Extension Service
Agricultural Experiment Stations

and

Fort Valley State University
College of Agriculture, Home Economics and Allied Programs
Cooperative Extension Program
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The Georgia Annual Report of Accomplishment FY2003

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Signatures required on the cover page and the expenditure reports are not included in the electronic versions of this report. Signatures are on record with original report.

INTRODUCTION:

The Georgia Annual Report of Accomplishments and Results for year 2002-2003 represents a coordinated effort between Georgia's 1890 and 1862 institutions – Fort Valley State University (FVSU) and the University of Georgia (UGA), and includes singular and combined results of Research and Extension units at both Universities.

Within the Extension Service UGA and FVSU state faculty with extension appointments coordinate efforts with UGA county faculty housed in 158 of Georgia's 159 counties. FVSU has 7 county agents of which are housed with UGA extension faculty. Extension programming is delivered as individual county efforts, multi-county programming, and state wide programming efforts.

The research programs of FVSU and UGA are conducted through the Agricultural Experiment Stations system. The Agricultural Experiment Stations consist of four major campuses located in Athens, Tifton, Griffin and Fort Valley, Georgia. These four campuses are supported by several research and education centers located strategically throughout the state.

Research and Extension faculty have made major accomplishments toward goals identified in the current Plan of Work. While reduced state funding has greatly impacted the efforts of our faculty, our organizations have been effective and productive during the past year. Many of the documented outcomes within this report demonstrated immediate and prolonged impact on the citizens of Georgia.

This report represents the Extension and Research programs of both the University of Georgia and Fort Valley State University as represented in the AREERA plan of work submitted in 1999. The accomplishments are recorded according to Key Themes and State Performance Goals.

In addition to this report, hundreds of impact statements may be accessed at

<http://apps.caes.uga.edu/impact/>

This impact database website contains advanced search capabilities that allow the user to sort for key words and program goals. These 2003 impact statements are summarized in a document entitled Countdown 2003 and can be located at

<http://interests.caes.uga.edu/impacts/countdown2003/index.htm>

Many of the accomplishments highlighted in this report are summaries of these impact statements. The impact statement database contains a great deal more information than the limited summaries included in this report.

GOAL ONE

AN AGRICULTURAL PRODUCTION SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY

Today, agriculture remains the largest segment of Georgia's economy. The 2002 Georgia Farm Gate Value Report identifies 8.8 billions in farm gate value for Georgia. Poultry accounts for 42% of the total value. The remaining 58% is greatly divided among a diverse agricultural system. The top ten commodities in the state are (listed in order): Broilers, Timber, Cotton, Eggs, Horses, Dairy, Beef, Greenhouses, Peanuts, Container Nursery.

There have been significant accomplishments toward improving the agricultural system in Georgia. The work has been diverse and representative of the industry in Georgia.

The Center of Agribusiness and Economic Development continues to assist producers of food and fiber products who do not generally have the ability to analyze new and emerging market opportunities, form appropriate business structures, and develop business plans in order to exploit emerging opportunities in the value added arena. From energy to roadside markets, the center has been directly involved developing new and/or more profitable agricultural enterprises in Georgia.

Tomato spotted wilt virus (TSWV) has become a major limiting factor in the production of tobacco, peanuts and other crops in Georgia. Losses due to TSWV have been as high as \$40 million in one year. The virus which had generated less than 1% loss fifteen years ago generated a 40% loss in tobacco crops in 2002. Extension and research faculty are attacking this virus on many fronts.

New cultivars have been developed that exhibit infection drops from 41% to 16%. The use of Admire 2F has been found to have good success in reducing TSWV 30-35% when applied to transplants. As a result of research the Admire 2F label was approved this year. Two new peanut cultivars, Georgia Green & Georgia-02C, have excellent TSWV resistance in addition to improved yields, grades and dollar value returns per acre.

Field trials in Cotton have demonstrated a superior performance of BGRR (Bollgard + Roundup Ready) varieties to the popular RR (Roundup Ready) varieties. After Extension educational efforts, use of the new variety has benefited Georgia farmers. Use of BGRR cotton rose to 43% in 2002 and 68% in 2003.

The Southeastern Small Fruit Center is an excellent example of multistate cooperation with limited resources. Scientists from multiple states have worked together with success. These collaborative efforts have been largely responsible for an \$8 million increase in Georgia blueberry production in the last two years.

Research and extension faculty were instrumental in getting a critical exemption for the use of methyl-bromide in Georgia's 30,000 acres of vegetables using plastic mulch. Currently, spring prepared plasticulture beds depend on methyl-bromide. With the

potential loss of \$83 million in reduced production, faculty members are working closely with farmers and EPA. While securing a critical exception for Georgia farmers, researchers have made significant progress on alternative systems. Collaborating with partner states, a new system for strawberries is already showing great success.

Extension educational efforts have been very successful in helping cotton farmers convert from plowed tillage systems to conservation tillage systems without the potential detrimental effects due to not adjusting fertilization and liming methods.

New technologies and discoveries have brought new directions in many areas. The application of acidic electrolyzed oxidizing (EO) water is a promising new technology for the management of diseases of greenhouse crops. UGA scientists have documented thrips (Thysanoptera) actively transmitting a plant pathogenic bacterium. This is the first such report worldwide. A simple inexpensive field test for aflatoxin has been discovered by UGA scientists. Costing twelve cents compared to the traditional ten dollar lab test, this new method allows for simple field screening with minimum expense. The development and implementation of a new herbicide approach to weed control in Georgia peanuts could result in a \$1.5 million savings in one year.

Hispanic labor is becoming the backbone of many industries in Georgia including agriculture, agribusiness, and the green industry. A great deal of effort has been successful toward breaking language and cultural barriers along with opening up venues of cooperation and networking. Extension faculty have made available many high quality and diverse educational materials targeting this audience. With the frequent use of hazardous chemicals, pesticides, and potentially dangerous equipment, these efforts are very important to educate Hispanic workers.

The sweeping changes and the late passage of the 2002 Farm Bill left many Georgia farmers in dire need for quick and accurate information. Extension faculty were instrumental in assisting farmers and supporting the Farm Service Agencies that were overwhelmed with the demand.

Georgia poultry producers spend over a billion dollars per year on feed. The University of Georgia poultry feed services lab has established the university as the leading center of nutritive energy determination of poultry in the western hemisphere.

Extensive studies conducted by the University of Georgia's Center of Forest Business have shown significant inequities with regard to the taxation of timber and forest lands. This research has brought about substantial changes to Georgia's tax assessor manual that will lead to greater equity for timberland holdings and help keep Georgia green.

This section of Georgia's Accomplishment Report highlights these and other accomplishments impacting agriculture.

Key Theme – Adding Value to New & Old Agricultural Products

State Performance Goal 1-1

- a. **In Georgia’s beef industry calves are primarily sold at weaning and are traditionally discounted** because they have a reputation of being inferior in quality and health status. These discounts have been estimated at \$5 per hundred pounds. For a producer with 100 cows and selling 75 of them per year, this amounts to approximately \$1,875 in lost income. The Georgia Beef Challenge was organized by the UGA Department of Animal and Dairy Sciences to inform Georgia cattle producers about the health, performance and carcass merit of their cattle. Consignors of the program build reputation and markets for cattle in Georgia.
- b. The performance of the cattle was excellent and profitability was good, considering the fluctuations in the market in 2003. **In 2002-03, over 3,500 calves were consigned to the program (a 64 percent increase over the previous year)**. The profit per head was \$55.67 with an added income to Georgia consignors of \$197,695.
- c. Smith Lever
- d. Multistate Extension: GA, IA

Key Theme – Adding Value to New & Old Agricultural Products

State Performance Goal 1-1

- a. Georgia’s Food and Fiber Industry continues to face dramatic change ranging from competition overseas to consumer changes in diets and taste. Such change requires producers and processors to be ever vigilant for new business opportunities. However, **both the quantity and quality information available to food and fiber entrepreneurs in Georgia is limited**. Furthermore, producers of food and fiber products do not generally have the ability to analyze new and emerging market opportunities, form appropriate business structures, and develop business plans in order to exploit emerging opportunities in the value added arena. The Center for Agribusiness and Economic Development was formed as a college wide Center jointly funded by Research and Extension. The Center concept allows for appropriate College Faculty to be matched with emerging food and fiber business opportunities. A dedicated staff of economist and data analyst provided support for the Center projects.

Twenty-seven feasibility studies that were prepared for new, emerging or expanding agribusiness firms have been conducted since 2000. Twenty-four special research reports on emerging policy issues of importance to Georgia’s

rural economy have been produced. An open and interactive web based analysis program for public and private decision makers utilizing the more than 1,400 annually updated databases of the Georgia County Guide and the Georgia Farm Gate Report is fully operational.

- b. **Many individuals in Georgia's agriculture community increase their profitability using the resources of this center.** Some examples in this fiscal year include: A cooperative of 20 road side stands operates collaboratively including a detailed joint marketing plan leading to a documented 35% increase in sales in the first year of operation. A cooperative of agritourism operations was developed leading to an increase of over 500% in sales. A detailed feasibility study of peanut processing aided a development of a producer owned peanut shelling operation, American Peanut Growers LLC, directly and indirectly responsible for employing 829 people with a total economic impact of \$50.7 million dollars annually.

Biodiesel and Biofuels to Electricity feasibility studies have lead to at least two companies developing Biofuels to energy companies. On company recently received a USDA grant for \$1 million for the development of a chicken litter to electricity production system.

- c. Hatch Act, Smith Lever, State funds
- d. Integrated Research and Extension

Key Theme: Agricultural Competitiveness, Plant Genomics

State Performance Goal 1-1

- a. **Losses from tomato spotted wilt virus (TSWV) in flue-cured tobacco in Georgia in 2002 exceeded \$19 million.** This serious virus disease, which infected less than 1 percent of the tobacco crop in the mid-'80s, had generated losses of 41 percent by 2002. UGA research projects employing a multi-discipline approach including Plant Pathology, Entomology, Crop and Soil Science and faculty from North Carolina State University and Clemson have been initiated. A farm was identified that has consistently had TSWV ranging from 20 percent to more than 80 percent for nearly the past 15 years and presented a unique opportunity to screen lines and cultivars for resistance as well as implement many other pathological studies. Up to 100 tobacco cultivars have been tested in a single season.
- b. For 2003 the susceptible variety K326 had 40.33% TSWV compared with the best test cultivars that exhibited infections from 16.76% to 6.1%. **It is apparent that there is a potential to dramatically cut losses from TSWV, if the best of these**

lines were combined with a good commercial line, there by saving millions of dollars for growers by selecting the appropriate cultivar.

- c. Multistate Research: GA, NC, SC
- d. Hatch Act, State funds

Key Theme: Plant Genomics

Performance Goal: 1-1

- a. The Georgia cotton industry from production of fiber through yarn and textile manufacture accounts for about \$3 billion of the state's economy. Georgia is the third largest cotton producing state in the U.S. and largest in the southeast. **The survival of Georgia's cotton industries is threatened by lack of improvement in variety selection for better yield potential.** Yield and fiber quality have not improved in the last 10 years, while production costs have concurrently risen faster than the rate of inflation, resulting in unit production costs often exceeding returns for many Georgia growers. Additionally, Georgia's fiber producers and processors face global competitive challenges that threaten the continuation of these jobs. Georgia's yarn and textile manufacturers cannot fully exploit more efficient manufacturing technologies to better compete in the global economy because fiber properties often do not meet the requirements of these efficient yarn and textile production technologies. Poor fiber quality of Georgia cotton for the last several years has damaged its reputation to the extent that certain yarn manufacturers now stipulate that they will not purchase Georgia cotton.
- b. The germplasm line GA200036 has similar or better yield potential than the popular transgenic varieties Stoneville 4892BR, SureGrow 215BR, and Stoneville 4793R. These varieties were planted to significant portions of the Georgia cotton acreage in 2003. Relative to these varieties, GA200036 has significantly longer staple length and higher fiber strength which are fiber characteristics desired by yarn manufacturers to construct strong high-quality yarns. **GA200036 is one of a slate of germplasm lines with improved yield and fiber quality being evaluated as varieties for Georgia growers** and for conversion to contain popular pest management traits such as glyphosate herbicide tolerance and resistance to a spectrum of insects that annually cause significant yield losses for Georgia producers.
- c. Hatch Act, IFAFS funds, Smith Lever, State funds
- d. Integrated Research and Extension

Key Theme: Agricultural Competitiveness

Performance Goal 1-11

- a. **Georgia cotton producers have been plagued by declining or stagnate yields and fiber quality.** One of the most important decisions producers make influencing yield and quality is variety selection. Subsequent to the availability and adoption of genetically engineered varieties, decisions on variety selection have centered on those traits. In the past variety selection was based on yield and performance. Now those decisions are first based on genetically engineered traits that varieties possess, and then yield and performance

To address this issue a series of identical trials were conducted at multiple locations across Georgia to examine the performance of Bollgard Roundup Ready (BGRR) varieties and Roundup Ready (RR) varieties of Cotton from the same family. In these trials insect pressure was kept to a minimum in both systems thus allowing for the comparison of yield, quality, and revenue on the basis of variety performance alone without the influence of inherit insect control. **Results from these trials indicated that BGRR varieties perform superior to RR varieties** even when insect pressure is minimal. This tendency for enhanced performance was magnified as yields surpassed 800 lb/A.

- b. The results of these trials were presented at agent trainings and county level grower meetings. This data in conjunction with statewide variety testing results and other extension efforts significantly influenced the cotton varieties planted in Georgia. **In 2002 Georgia cotton farmers planted 43% of the acreage to RR varieties and 43% to BGRR varieties; in 2003 the percentages were 19% and 68%, respectively.**
- c. Smith Lever
- d. State specific

Key Theme: Agricultural competitiveness, Plant Genomics

State Performance Goal: 1-11

- a. Georgia leads the nation in total annual peanut production with nearly half, and average state peanut yields have more than tripled in the latter half of the 20th Century. Publicly developed cultivars have played a major role in this overall progress, and the quality of this vitally important commodity has likewise been enhanced.

The **Georgia Peanut Breeding Program** is actively involved in the development of improved cultivars with desirable traits for increasing dollar value, yield, grade, disease resistance, insect resistance, virus resistance, nematode resistance,

aflatoxin resistance, drought tolerance, better shelling characteristics, longer shelf-life, and enhanced flavor and nutritional qualities. Possibly, no other single research effort can benefit the whole peanut industry as much as an improved cultivar.

- b. **One new peanut cultivar with a 10% yield and dollar return advantage over the current crop value estimate for the State of Georgia would mean an additional \$40 million increase annually. Georgia Green is such a new high yielding runner-type cultivar** with a high level of resistance to tomato spotted wilt virus (TSWV). Since its recent release, Georgia Green has quickly gained acceptance throughout several major peanut producing states (Georgia, Florida, Alabama, South Carolina, Texas, and Oklahoma). It has been found to be very productive across many different environments (irrigated and nonirrigated, single and twin row patterns, etc). Compared to Florunner the previously popular cultivar, Georgia Green was found to have a 30-40% increase in yield and 45-60% increase in dollar value.

GEORGIA-02C is a new high-oleic runner-type variety that was released in 2002 by the Georgia Agricultural Experiment Stations. It was also developed at the University of Georgia's Coastal Plain Experiment Station in Tifton, GA. Georgia-02C has similar maturity as Georgia Green with seed and pod size slightly larger. It also has the high oleic and low linoleic fatty acid oil chemistry with spreading runner growth habit similar to AgraTech 201. Georgia-02C has resulted in higher yields, grades and dollar value returns per acre than Carver, C-99R, A Norden, Hull, and AgraTech 201. Georgia-02C has excellent TSWV resistance as well as CBR resistance.

- c. Hatch Act, State funds
- d. State Specific

Key Theme: Agricultural Competitiveness

State Performance Goal 1-12

- a. Limited resources do not allow each state to duplicate efforts and programs even though industries and clientele groups may be rapidly expanding. This is the case in the Southeast with Small Fruit Production. Small fruit crops are knowledge and technology-intensive enterprises, and all the land grant universities in this region have their strengths and weaknesses with regard to expertise and information dissemination with these crops. **It is far more cost effective to meet the demands for small fruit crop information and research with a regional approach** that capitalizes on the individual strengths of each cooperating land grant university. This is the basic premise on which the Consortium is founded. It originally involved Clemson University, the University of Georgia, and North

Carolina State University, and was initially established as the **Southeastern Small Fruit Center** in January 1999. In March 2000, the name was changed to the Southern Region Small Fruit Consortium. The reason for the name change was to include all the Southern Universities not just those in the Southeast. In 2002 the University of Tennessee joined consortium. The long term mission of the Consortium is envisioned to involve collaborative efforts at various sites across the region between small fruit growers and grower organizations, industries and service organizations allied with and/or serving small fruit growers, agricultural extension programs and research stations working together to enhance the development of the small fruit industries in the region.

- b. **Thirteen research grants totaling \$58,750 were awarded in 2003 to researchers from the 4 cooperating states.** A total of \$55,000 was budgeted for 2004 research proposals.

An example of the Southern Region Small Fruit Consortium impact is blueberry production. Recent releases of new cultivars like the Ochlockonee have increased yields by more than 65% over a five year period. The berry size has increased by 35%. This and other research has benefited Georgia's industry. The value of **Georgia blueberries increased over \$8 million** over the last two years and the trend continues. **This increase is due to research results developed through the Southern Region Small Fruit Consortium.**

- c. Hatch Act
- d. Multistate Research: GA, NC, SC, TN

Key Theme: Agricultural Competitiveness

State Performance Goal: 1-12

- a. The use of polyethylene mulch has become more common for many different spring and fall vegetables, including seeded or transplanted pepper, tomato, squash, watermelon, and cucumber. Following the spring crop, fall planting of eggplant, squash, cabbage, cucumber, and tomato are made directly into the existing polyethylene-covered beds. **Currently, spring prepared plasticulture beds depend on methyl-bromide (MBr) application for season long weed and pest control.** Generally there are no rotation issues with MBr for fall vegetables. However, the use of **MBr is scheduled to end in 2005** and cost for this product continue to increase in the interim. Season long suppression and control of plant pathogens, nematodes, and weeds must be considered when alternatives for MBr are researched. Current research in spring crops is focusing on potential MBr alternatives that include combinations of fumigants and herbicides [e.g. metolachlor (Dual products), halosulfuron (Sempra), and sulfentrazone (Spartan)]. When applied as part of a weed management program for spring formed beds,

herbicide injury to fall planted vegetables becomes a rotational issue. Therefore, studies were initiated to determine fall vegetable response following a spring application of halosulfuron, metolachlor, and sulfentrazone applied under polyethylene mulch.

- b. Research found injury to plants, vine length issues, and yield differences and overall tolerance differences between each chemical and vegetable. This research indicates carryover potential and injury to vegetables where herbicides are used to control nutsedge in polyethylene mulch production. If not properly evaluated for injury and yield reduction potential, **herbicide carryover could cost vegetable producers thousands of dollars per acre.**
- c. Hatch Act, Smith Lever
- d. Integrated Research and Extension

Key Theme: Ornamental/Green Agriculture

State Performance Goal: 1-12

- A: Numerous golf courses, athletic fields and home lawns with bermudagrass are overseeded with perennial ryegrass in the early fall months. This cool-season turfgrass is primarily used for overseeding due to its attractive, dark green color during the winter and early spring months, which is a time period that bermudagrass becomes dormant. However, the control of annual bluegrass is a problem due to the presence of perennial ryegrass. While the attractive green color of perennial ryegrass is desirable during the cold months of the year, this species is not desirable during the early and spring months. During this time period, bermudagrass begins spring growth, and is adversely affected by perennial ryegrass. **Turf managers are in need of herbicide programs that will remove perennial ryegrass but not affect the spring transition of bermudagrass.**
- b. Research being conducted at the Griffin campus has developed programs to control annual bluegrass, in bermudagrass overseeded with perennial ryegrass, and that do not adversely affect the growth of these turfgrasses. Also, research is now being conducted on the selective, postemergence control of this weed in overseeded bermudagrass with bispyribac-sodium (Velocity) and sulfosulfuron (Battalion). Due to this research Velocity is now labeled for this use in Georgia, South Carolina, and Florida. Research conducted at Griffin has shown that several recently-released herbicides can be used to suppress perennial ryegrass and not significantly affect the spring transition (green-up) of bermudagrass.

Turfgrass managers now have numerous options to: a) control annual bluegrass in overseeded bermudagrass, and b) remove perennial ryegrass without adversely affecting the spring transition of bermudagrass.

- c. Hatch Act
- d. State Specific

Key Theme: Agricultural Competitiveness

State Performance Goal: 1-12

- a. More than 1 million acres of pine forests are fertilized with urea each year in the southern USA. **Information on the effect of rainfall on ammonia loss from such applications is currently very limited, and is needed to better manage N applications in pine forests.**

Field studies were conducted to evaluate the effect of timing of rainfall on ammonia losses. The studies were carried out from March through November 2002, and evaluated ammonia loss following an application of 200 kg N/ha as urea. Simulated rainfall (0.15 to 1.5 inches) was applied to the forest floor after the urea was dissolved by dew, which took from 4 to 7 days, depending on environmental conditions. Ammonia losses were measured for 29 days in three studies, and for 58 days in one study. Also, a laboratory study was conducted to confirm field results and to further evaluate the effect timing of rainfall had on ammonia losses from urea. In this study, simulated rainfall (0.8 inches) was applied to the forest floor before urea application (200 kg N/ha), immediately after urea application, and 1, 2, and 3 days after urea application. Ammonia losses were followed for 31 days.

- b. In all field studies, rainfall did not reduce ammonia losses from urea and in some cases rainfall tended to increase losses. In the laboratory study, maximum losses occurred when simulated rain was applied before urea application, and minimum losses occurred when simulated rain was applied immediately after urea application. Rain occurring 1, 2, and 3 days after application did not eliminate ammonia losses. From these studies, we concluded that if rain occurs immediately after urea application, urea is leached into the soil, which practically eliminates ammonia losses. If rain occurs after urea has dissolved on the forest floor, however, urea is not completely leached into the soil, probably because of adsorption by some forest floor components. As a result, rain occurring after urea is dissolved by dew is not likely to eliminate ammonia losses. **These results should help manage urea applications to pine plantations in the southeastern USA.**
- c. Hatch Act
- d. State Specific

Key Theme: Agricultural Competitiveness

State Performance Goal: 1-12

- a. Due mostly to the current economics of farming, cotton growers in south Georgia are converting from conventional, plowed tillage systems to conservation or minimum-till. **Since 1995, the number of cotton acres being "strip-tilled" (the most common form of conservation-tillage in South Georgia) has increased from approximately 75,000 to 525,000 acres.** This major change in tillage systems has forced growers to reexamine other production practices and adjust them in order to maintain high cotton yields, quality and profitability. One area of reexamination includes fertilization and liming. Growers switching from conventional to conservation-tillage have many questions such as should I soil sample differently?, how does lime work if I don't plow it in ?, should I use a starter fertilizer?, do I need to manage nitrogen differently when using a cover crop ?, and can I still use poultry litter fertilizer if I change to strip-till ? Questions concerning nitrogen management and use of chicken litter in strip-till also have environmental implications that are related to water quality.

Different soil sampling techniques (depth and location) have been evaluated and monitored by working with growers and looking at soil test results. Conservation tillage cotton farmers were also polled concerning starter fertilizer materials, rates, placements and potential starter burn problems. Since nitrogen and poultry litter use are both agronomically and environmentally at issue, a number of on-farm research and demonstration projects have been conducted looking at use of these fertilizer materials. For example, immobilization of nitrogen following a small grain cover crop and giving nitrogen credits to winter legume cover crops were examined. Results from these field trials and observations were then transferred to the grower using traditional extension delivery methods such as field days, county meetings, TV, radio, newsletters and popular press articles. Many of these delivery methods reach state as well as regional audiences

- b. Based on correspondence with county agents and directly with growers, **these "new" techniques of fertilizing and liming conservation tillage are being adopted.** Cases where these necessary adjustments have not been made and crop yields have been affected are few. Overall, conservation-tillage cotton growers have been able to maintain crop yields, quality and profitability when converting from conventional tillage. In addition, **the number of cotton acres converted to conservation tillage– with minimal detrimental affects due to not adjusting fertilization and liming methods– continues to increase every year.**
- c. Smith Lever
- d. State Specific

Key Theme: Agricultural Competitiveness, Agricultural Profitability, Plant Health

State Performance Goal 1-16

- a. The production of ornamental crops is one of the fastest growing segments of agriculture in the United States with an estimated value of over \$12.1 billion in 1998. The value of the greenhouse and nursery industry in Georgia was \$406.6 million dollars in 2002. **Gerbera daisy is a popular ornamental that is susceptible to powdery mildew.** It is used as a cut flower and flowering pot plant as well as being widely used as a landscape bedding plant. Like many other greenhouse-grown plants, gerberas are susceptible to powdery mildew, a potentially devastating fungal disease. An important management tool for control of powdery mildew is the use of fungicides. However, increasing concerns about the impact of pesticides on the environment, worker safety issues, and the appearance of fungicide resistance in target populations contribute to the need for alternative pest control measures.

Application of acidic electrolyzed oxidizing (EO) water is a promising new technology for the management of diseases of greenhouse crops. EO water is generated by passing electric current through a salt solution diluted with tap water followed by separation of the charged products. Water collected from the anode (EO water) is bactericidal and fungicidal due to the combination of high oxidation-reduction potential, low pH, and the presence of hypochlorous acid. Research with EO water has focused primarily on the elimination of human pathogen bacteria from food and food service equipment. Only recently has EO water been investigated as a plant disease management tool. The objectives of our studies were to evaluate EO water in combination with fungicides in an integrated management system for control of powdery mildew on gerbera daisy

- b. In greenhouse trials, EO water significantly reduced powdery mildew on gerbera daisies when sprayed twice a week and when sprayed every other week, alternating with fungicides. Mixing EO water with several fungicides or insecticides did not affect efficacy against *Botrytis cinerea* conidia in an in-vitro assay, suggesting the potential for tank mixing EO water with more traditional control products. The ability for onsite generation and short-term storage of EO water could allow for injection into irrigation systems. Ongoing research focuses on the use of EO water to complement traditional management options for foliar diseases of greenhouse crops.
- c. Hatch Act
- d. State Specific

Key Theme: Agricultural Competitiveness, Agricultural Profitability, Plant Health

State Performance Goal: 1-16

- a. **Diseases of onion continue to plague Georgia growers.** Center rot of onion, caused by *Pantoea ananatis* and *P. agglomerans*, first became a problem in Georgia in 1997 and has continued to be a problem. The disease, originally reported from South Africa also has been found in Colorado, Michigan and recently in the country of Peru. UGA Scientists demonstrated the complexity of center rot of onion, by showing that the *P. ananatis* can be seedborne, survive epiphytically on a wide host range of crops and weeds and be associated with tobacco thrips, *Frankliniella fusca*. In addition to a possible connection with seed produced in South Africa, disease gradients in onion fields and the lack of control by copper bactericides has caused the focus on thrips as a potential vector and seed as a primary source of inoculum.

Using a nondestructive sampling assay that UGA scientist developed, they were able to identify and sequester thrips that contained internal populations of the gut-inhabiting *P. ananatis*. When a mean number of eight "positive", bacteria-carrying thrips were placed on onion seedlings in replicated trials, the average disease transmission rate was 52%. In comparison, when eight negative thrips (negative control) were placed on onion seedlings, 0 % disease was the result. Although members of the Coleoptera, Hymenoptera, Homoptera and Hemiptera have been reported as vectors of prokaryotic plant pathogens, and thrips have previously been reported as a vector of tomato spotted wilt virus, **this is the first report worldwide of thrips (Thysanoptera) actively transmitting a plant pathogenic bacterium.** Considering that approximately 10% of the thrips population are infested with the bacterium and that there was an approximate 50% transmission rate with a population of eight positive thrips, one can conservatively estimate an overall transmission rate of approximately 0.6 % for the total thrips population.

- B. This is a significant rate of transmission and has strong implications in the epidemiology of this disease. **Now that we have conclusively proven that thrips can vector this bacterium, we can target thrips for control** to determine if in turn that will reduce disease incidence.
- c. Hatch Act, Smith Lever
- d. Integrated Research and Extension

Key Theme: Agricultural Competitiveness, Agricultural Profitability, Animal Health, Plant Health

State Performance Goal: 1-16

- a. The analytical costs associated with aflatoxin research are much too expensive and complex. **There is a great need for a simple inexpensive method to test for aflatoxin in research and field surveys.** Investigations completed in 2001-2003 have discovered a new approach. UGA Scientists have used bromine or beta-cyclodextrins to enhance the fluorescence of aflatoxins after an extraction with 80 % methanol-water or 80% acetonitrile-water. The work published using several beta-cyclodextrins with HPLC aflatoxin analysis was verified and we have been able to extend this work to develop a rapid screening method. The samples are extracted in 80 % methanol or 80% acetonitrile, filtered, the sample is diluted and the beta-cyclodextrin or bromine is added to the sample. The resulting mixture is placed in the fluorometer and results read.
- b. **A new screening method has been identified. The total cost for this procedure is about \$0.12 in supplies compared to \$5.00-10.00 with the Vicam method.** The results can be used for field screening from 50-100,000 ppb and more expensive techniques can be used to verify the results when needed. This simple method will make field screening possible with a minimum expense.
- c. Hatch Act
- d. Multistate Research: GA, USDA

Key Theme: Agricultural Competitiveness

State Performance Goal: 1-18

- a. Purchasers of U.S. flue-cured tobacco have been concerned about the excessive residue levels of maleic hydrazide (MH), a chemical sucker control used universally by all flue-cured tobacco producers in the U.S. Historically, Georgia produced tobacco has contained higher residue levels than found in tobacco from the other U.S. production areas. Some purchasers have reduced or even cancelled their purchases of tobacco from Georgia because of the concern for MH residue levels. The most vocal purchasers regarding MH residues are outside the U.S. Over 50 percent of Georgia tobacco is ultimately sold outside the U.S. **The international target for MH residues on tobacco is 80 parts per million. Georgia tobacco samples have yearly averaged from 125 ppm to 210 ppm over the last 15 years.**

On-farm demonstrations were conducted to evaluate potential sucker control programs which minimized dependence on MH for control of suckers while maintaining an acceptable level of sucker control. County agents and growers have cooperated to conduct demonstration plots, field days and county meetings to inform growers of acceptable treatments. The program demonstrated includes early and multiple treatments of contact fatty alcohol to burn our suckers as they develop during flower emergence. The program includes the use of flumeturon

- (Prime+, FluPro) along with an additional application of a contact fatty alcohol in a tank mix with MH as the final treatment in the program. Finally, the program includes the labeled application rate of MH (2.25 lbs/A) in the three-way tank mix. Residue samples, counts and weights of escaped suckers indicate the efficacy of this treatment.
- b. As a result of the cooperative efforts of county agents, growers and university specialists a sucker control program has been developed and fully tested which results in acceptable residue levels and acceptable season long sucker control. With this treatment **growers can now control troublesome sucker growth and produce cured leaf which has acceptable MH residue levels to be purchased by domestic and international customers.** If this approach is followed Georgia growers will be assured of market demand and will avoid the loss of a market for their product.
 - c. Smith Lever
 - d. State Specific

Key Theme: Agricultural Competitiveness

State Performance Goal: 1-2

- a. **A recent survey of county extension agents indicated that tropic croton (Croton glandulosus) is the 3rd most troublesome weed in Georgia peanuts.** The most frequently used herbicide on peanuts in Georgia is Cadre (imazapic). Unfortunately, this herbicide does not provide effective control of tropic croton. Because Cadre does not adequately control this weed, growers are interested in finding a cost-effective tank-mix partner that would improve control. Ultra Blazer (acifluorfen) is the most effective post-emergence herbicide for the control of tropic croton in peanuts but little information is available on its use in combination with Cadre.

Replicated, on-farm field trials were conducted in 2002 and 2003 in Webster and Wilcox counties to evaluate the influence of reduced rates of Ultra Blazer in combination with Cadre for the post-emergence control of tropic croton. Results indicated that 8 ozs/A of Ultra Blazer, applied in combination with Cadre, would provide acceptable control of tropic croton when applied before the weed exceeds 2" in height.

- b. Previously, the UGA standard recommendation for the control of tropic croton in peanut was to apply 24 ozs/A of Ultra Blazer at a cost of \$16/A including the application. The results of our tests indicated that a grower could save \$11.75/A by applying 8 ozs/A of Ultra Blazer in combination with Cadre. **With an estimated 25% of the peanut acres in Georgia requiring a post-emergence**

herbicide for the control of tropic croton (133,750 acres); this would result in a potential savings of \$1,571,563/year for Georgia peanut farmers.

- c. Smith Lever
- d. State Specific

Key Theme: Agricultural competitiveness, Agricultural Profitability, Plant Health

- a. It is estimated in Georgia that several industries including **construction, manufacturing, food service, green industry, agriculture and agribusinesses use Hispanics as the backbone of the workforce.** Language and cultural barriers hamper efficiency and production. **The frequent use of hazardous chemicals, pesticides, potentially dangerous equipment and tools, the fact that they work in inclement weather and the repetitiveness of tedious activities in their daily routines makes this group particularly prone to mismanagement of products, resulting in work-related accidents.** These facts concurrently result in economic, health, and legal concerns. Therefore, there is an urgent need to increase cultural awareness and proficiency, to develop training programs and, to publish information in Spanish, while Hispanic workers improve on English skills and/or management improves in Spanish.

A multi-institutional and interdisciplinary group of professionals headed by UGA College of Agricultural and Environmental Sciences specialists have combined their efforts in addressing the need to facilitate communication between business administrators and the Hispanic labor force, as well as promote awareness of cultural differences and their impact on productivity, work place safety and human relations. This group has been named Georgia Hispanic Specialist Group (GHSG). The group has implemented a series of statewide training programs to improve productivity and safety in the workplace. Bilingual materials have been developed to target the Green Industry Hispanic workforce. Additionally, seminars in English, targeting managerial staff, have been developed to improve cultural awareness, productivity and to address the critical topic of safety at the workplace.

- b. A total of 1,300 individuals have been directly contacted, educated and impacted with these series of trainings and programs. Approximately 30,000 Hispanic Green Industry and Agriculture related clients have benefited from bilingual published materials now available in several journals and magazines with state and nation wide circulation. The Georgia Green Industry Association journal now regularly publishes articles in English with their respective translation to Spanish. The Georgia Turfgrass Association journal “GTA Today” publishes a bilingual technical article monthly; the GHSG group has developed posters and brochures in Spanish for the “Clean Water Campaign” organization. A bilingual internet site has been developed on Forestry issues. **These efforts and results represent an**

outstanding step toward breaking language and cultural barriers and opening up venues of cooperation, networking and the availability of high quality and diverse educational materials.

- c. Smith Lever
- d. States Specific

Key Theme: Agricultural Competitiveness, Agricultural Profitability, Plant Health

State Performance Goal 1-2

- a. **Spotted wilt, caused by tomato spotted wilt virus (TSWV) has been a major cause of tobacco disease loss** since it was identified in Georgia in 1985. Some means of spotted wilt management is necessary to maintain suitable production levels. Over 300 farm trials have been conducted since 1990 in an effort to find leads to a spotted wilt management program. Most trials have yielded data that has greatly improved understanding of spotted wilt but little of value in developing a management plan. A breakthrough came in 1997 when it was found that Admire 2F applied to transplants could reduce spotted wilt incidence. Since 1997 over 100 trials have validated this finding. Admire application in a plant house has been found to have an 86% chance of successfully reducing spotted wilt by about 30-35%. Admire application in transplant water reduces spotted wilt in bare root transplants by 25-30% with a 54% chance of success. Work is ongoing to improve the latter situation. A second breakthrough came in 1999 when experiment station trials found treating transplants with Actigard 50WG reduced spotted wilt. Forty eight farm trials conducted between 2000 and 2002 verified this finding.

The data base generated by the 48 farm trials was used to support a third party registration for use of Actigard in plant houses and beds for management of spotted wilt. The research was completed during the 2002 season. The label was approved during the winter of 2002-3 in time for use on the 2003 crop. During these trials it was found that best control of spotted wilt resulted from a combination program using both Actigard and Admire. **We can now offer the Georgia tobacco grower a program based on Actigard and Admire that can provide a 40-60% reduction in spotted wilt incidence.**

- c. Hatch Act, Smith Lever, State funds
- d. Integrated Research and Extension

Key Theme: Agricultural Competitiveness, Agricultural Profitability, Plant Health

State Performance Goal: 1-2

- a. **Gummy stem blight (GSB), caused by the fungus *Didymella bryoniae*, is the most widespread and destructive disease of cantaloupes, cucumbers and watermelons in Georgia and in most of the Southeast.** Management options for this disease are rotation, deep turning soil, proper irrigating timing and preventive fungicide applications. Of these management options, preventive fungicide applications are the most effective. UGA plant pathologists conducted trials on watermelon at three locations in Georgia in 2003 to identify effective materials for the control of gummy stem blight on watermelon and to characterize use patterns of these materials. Pristine, a premix of the fungicides pyraclostrobin and boscalid, was found to be highly effective against gummy stem blight and downy mildew, and performed as well or better than chlorothalonil (the standard fungicide), depending upon the location of the test. Improved control of disease with pyraclostrobin plus boscalid was associated with significant increases in yield compared to untreated plots, and no phytotoxicity was observed. The excellent efficacy of pyraclostrobin, along with low phytotoxicity, will make it an ideal compound to use late-season on maturing melons.
- b. **The new material will be available to growers in 2004**, having been labeled for use in watermelons and other cucurbits in 2003. The use of pyraclostrobin plus boscalid in a comprehensive disease management program should allow watermelon, cantaloupe, and cucumber growers in Georgia to significantly reduce losses to gummy stem blight, thereby increasing farm gate income.
- c. Hatch Act
- d. State Specific

Key Theme: Agricultural Competitiveness, Agricultural Profitability, Plant Health

State Performance Goal: 1-2

- a. **In order to grow commercial strawberries in Georgia, soil fumigation must take place** to reduce populations of major and minor fungal/bacterial pathogens and nematodes. Methyl bromide has been the standard fumigant of choice, but will no longer be available after 2005. Therefore, alternatives to methyl bromide are essential if strawberry production is to continue in Georgia.

In a collaborative effort with North Carolina State University, alternative fumigants have been tested for the last three years, with testing concluded in 2003. For disease control, UGA and NC scientist determined that combination of three fumigants (1,3-dichloropropene, metam-sodium, and chloropicrin) can achieve disease control and subsequent yields of strawberries which are equivalent to methyl bromide treatment. Application of these three fumigants

through standard incorporation equipment was generally more effective than application through drip irrigation systems.

- b. **With the information generated from this research, Georgia strawberry producers now have a research-based alternative to use of methyl bromide for control of soilborne diseases and nematodes.** If methyl bromide is removed from the market as expected, Georgia producers can continue to produce strawberries through use of these alternative fumigants.
- c. Hatch Act, Smith Lever
- d. Multistate Integrated Research and Extension: GA, NC

Key Theme: Agricultural Competitiveness

State Performance Goal: 1-2

- a. **Determining when to harvest peanuts is one of the most important economic decisions growers make each year.** Peanuts are indeterminate in maturity, and may gain 300 to 500 pounds per acre, as well as 2 to 3 % in grade during the 10-day period before optimum harvest. Growers determine when to harvest by blasting a sample of peanut pods with a machine which uses compressed air, water, and glass beads. A peanut maturity profile is then established based on the pod maturity color. **The blasting machine has served the industry well for almost 20 years, but there remained a need for a simplified, less-expensive and environmentally-safe method for processing the pod sample.**

A new turbo-blasting method using a high pressure washer, a rotating turbo nozzle, and a wire mesh basket has been developed for stripping away the outer pod layer and exposing colors of the middle layer which are indicative of peanut pod maturity.

- b. **The method is simple, low-cost, and can be constructed easily and quickly from a few simple things.** Further, the device is portable and can be taken directly to the grower's field rather than having to process the sample at a central site. The uniqueness of this method is its versatility. Peanuts can be blasted almost anywhere quickly. Plus, the pressure washer can be used to clean the digger to prevent disease transmission between fields.
- c. Hatch Act, Smith Lever
- d. Integrated Research and Extension

Key Theme: Agricultural Competitiveness

State Performance Goal: 1-4

- a. **Beef cattle are produced in virtually every county in Georgia.** According to USDA there are approximately 600,000 beef cows in the state. Although many calves are marketed through local auction facilities at weaning, many producers still stocker their calves or purchased calves for 90-180 days, or have the cattle custom-finished and harvested in states such as Iowa, Texas, or Kansas. Fluctuations in winter grazing costs along with changing feeder and finished cattle values make the decision a complicated one for many producers.

Economic analyses comparing various management and marketing alternatives were developed periodically through the year. These analyses centered around timely decisions that producers were facing. These analyses considered pasture costs, drylot feeding costs, current calf values, and expected feeder or fed cattle values. In some instances it was more beneficial for producers to market their calves immediately. In other cases it was beneficial to retain ownership of the cattle. Results of these finding were disseminated through extension newsletters, popular press articles, radio interviews with CAES personnel, and county and state producer meetings.

- b. Numerous producers and county extension agents have indicated the usefulness of this information. Furthermore, they have provided instances of where they used this information in making a management or marketing decision. In 2003, the difference in many alternatives was about \$30 per head. **If this number is applied to only ten percent of the state's 580,000 head calf crop, the increase in net income amounts to almost \$1.5 million annually.**
- c. Smith Lever
- d. Multistate Extension: GA, TN

Key Theme: Agricultural Competitiveness

State Performance Goal: 1-4

- a. **The sweeping changes and the late passage of the 2002 Farm Bill left many Georgia farmers in dire need for quick, accurate information on the program.** Many producers had the option of changing bases for the time period of the bill. Sign-up for the new program would begin in October 2002 and conclude in March 2003. Many Farm Service Agencies were not ready for the influx of producers due to organizing producer records and new bill guidelines. After Farm Service Agency regulations were in place, county agents worked in concert with university specialists and Farm Service Agency Representatives to conduct trainings on the new farm bill.

- b. In Houston County the agent worked one on one with over fifty producers and landowners with computer software provided by UGA specialists to assist in making decisions on which option to select for base determination. This accounts for about 99% of the producers in Houston County. The agent also explained the changes and implications the new farm bill could have on land use, base determination, crop production, and farm profitability along with providing detailed printouts of commodity base options under the new farm bill. “Bruce helped explain the new terminology and ran the analysis for when my FSA office wasn’t prepared and couldn’t answer my questions,” said Crawford County farmer Grady Shaw. The agent assisted Farm Service Agency employees with data acquisition and interpretation, which generated Houston County producers over 2 million dollars in government payments. “Bruce allowed me to enter data into the system while he ran the analysis for the producers. **There is no way we could have handled the load as quickly as we did in Houston County. They would have been lined up out into the streets,” claimed Jean Nesmith, Farm Service Agency Program Tech/Acting CED in Houston County.**

In Crisp County more than 150 local farmers received vital Farm Bill training at the sessions coordinated by the Crisp County Agent. According to the Crisp County Farm Service Agency Director, “Ken’s efforts were a tremendous help to our FSA office as well as to our producers. He played a vital role in educating and helping our farmers make decisions worth millions of dollars.” The Agent ran 125 computer scenarios for Crisp County farmers, projecting the economic impact of the various Farm Program options available to them. **The Agent helped farmers make decisions that could increase their USDA Farm Program payments by approximately three million dollars over the seven year life of the program.**

- c. Smith Lever
- d. State Specific

Key Theme: Agricultural Competitiveness

State Performance Goal: 1-4

- a. Georgia produces about 38,000 acres of vegetables using plastic mulch, mostly with drip irrigation. Methyl bromide (MBr) is an all-purpose fumigant used to control nematodes, soil-borne pathogens and weeds (primarily nutsedge) when plastic is installed. **Without MBr, nutsedge can easily penetrate the plastic and compete with the crop.** MBr has been designated to be removed next year. Although, acceptable replacements have been found for controlling nematodes and most soil-borne pathogens, a suitable replacement to control nutsedge has not been found. The U.S. Environmental Protection Agency began a process in June 2002 to seek exemptions to the Montreal Protocol for critical uses of methyl

bromide in the U.S. Without MBr, Georgia growers would lose yield and quality in the crops produced using this system - primarily squash, cucumber, eggplant, tomato, pepper and cantaloupe. If growers were forced to return to irrigated, bare ground production instead of plastic mulch production on these crops, the net loss in farm gate value would be in excess of \$85 million. The Georgia Fruit and Vegetable Growers Association requested the help of UGA agricultural scientists to prepare the applications for critical use exemption. Horticulturists, crop and soil scientists and plant pathologists worked together with agricultural economists to prepare the detailed and voluminous critical use exemption packages. Material that had to be included in the packages were climate conditions, MBr use patterns, historical yields and acreages, economic analysis, research findings on alternatives and justification why alternatives that may work in other parts of the world will not work for Georgia.

- b. More than 4,000 pages of documentation were assimilated for inclusion in the packages. **The EPA in the domestic review process gave favorable comments on the packages submitted by Georgia. The Georgia packages were also used as a model for other state's packages. In October, 2003 MBTOC gave approval to the U.S. for all of the Mbr requested by EPA for 2005.** The allocation process is not yet complete domestically, but Georgia expects to get an ample supply of methyl bromide for 2005. Yields of these crops would be reduced by as much as 50 percent without MBr. However, in reality without MBr, most Georgia growers could no longer profitably produce peppers and eggplant. Also, there would be quality losses and the growth of the Georgia vegetable industry would be stifled. **Therefore, the total impact of the critical use exemption package on the Georgia agricultural economy would be in excess of \$130 million each year.**
- c. Smith Lever
- d. State Specific

Key Theme: Agricultural Competitiveness

State Performance Goal: 1-4

- a. For years, wheat producers were able to manage annual ryegrass with the herbicide Hoelon™ (diclofop-methyl). Recently, **ryegrass has become resistant to Hoelon™**. This weed, if uncontrolled, can reduce wheat yields by at least 70%. Searching for alternative methods to manage Hoelon-resistant ryegrass has been underway for many years in Georgia. Over the past four years, at least twenty-eight trials in seven wheat producing counties were conducted in the search for valid alternatives. Axiom™ (flufenacet + metribuzin), a herbicide from Bayer CropScience, has proven effective in managing Hoelon-resistant ryegrass without affecting wheat development. Utilizing data generated in

Georgia and North Carolina, we submitted a section 18 request for the use of Axiom™ in wheat to the Georgia Department of Agriculture and the Environmental Protection Agency (EPA) in 2003.

- b. The section 18 request was granted in less than 10 days. **The use of Axiom™ is estimated to increase grower returns by \$634,182 in 2004.** More importantly, growers will be able to continue producing wheat because of the ability to manage this resistant ryegrass.
- c. Hatch Act, Smith Lever
- d. Integrated Research and Extension

Key Theme: Agricultural Competitiveness

State Performance Goal 1-4

- a. **Weed management is often one of the most limiting factors in producing Georgia vegetables.** Herbicides are often the most economical means available to manage weeds in vegetables; however, options are extremely limited. In addition, the existence of many currently labeled herbicides is threatened because of tougher Environmental Protection Agency (EPA) regulations. Thus, the continual loss of weed management options coupled with limited labeling of new herbicides poses a serious threat to vegetable production in Georgia.

In cooperation with the Georgia Fruit and Vegetable Growers Association, a Third Party Indemnification Program was developed in which the Association would hold and implement herbicide labels for its growers. Additionally, the use patterns for each herbicide had to be developed from UGA research trials.

- b. **Two new herbicide labels were obtained for growers during the fall of 2003.** One of these products is now labeled for use in pepper while the other label offers a new tool in cabbage. Economic impact from this program is immeasurable as many future pest management tools will now become available because of developing this program. These results were possible through the efforts of the University of Georgia and the Georgia Fruit and Vegetable Growers Association.
- c. Smith Lever
- d. State Specific

Key Theme: Agricultural Competitiveness, Agricultural Profitability

State Performance Goal: 1-6

- a. Georgia currently has nearly 11,000 poultry houses in operation with more being built each year. **To be competitive in the U.S. Poultry industry, poultry producers in Georgia must utilize the best available technologies and management programs** to achieve energy efficiencies and to provide optimum environments for maximum bird growth performance. The proper operation of ventilation, cooling, and brooding systems is particularly critical in Georgia due to the severe summer climates.

Educational programs and publications related to best management practices for summer and winter ventilation of poultry houses have been developed and implemented. A summer and winter Multiple workshops related to tunnel ventilation management of poultry houses were offered for poultry service personnel and poultry company managers. Over 200 individuals participated in these educational programs during 2003. All participants were provided training manuals with detailed training information.

- b. This is a well developed on going program that has had tremendous impact over the years. **As a result of these programs, Georgia Poultry producers achieve some of the best bird performances for their flocks in the U.S.** Because of these educational efforts, all new poultry houses are equipped with state of the art technology and managed with best management practices.
- c. Smith Lever
- d. State Specific

Key Theme: Agricultural Competitiveness, Agricultural Profitability

State Performance Goal: 1-8

- a. **Georgia poultry producers spend over a billion dollars per year on feed.** Availability of consistently high quality feed ingredients allows the producer to formulate feeds more efficiently. Since feed represents over 70% of the cost of producing poultry product, producers can achieve substantial savings through effective ingredient analysis and utilization.

The UGA poultry feed services lab has conducted hundreds of ingredient analysis for more than two dozen poultry companies in Georgia and the southeastern U.S. As a result of the research effort, more than a half dozen publications on feeding formulation and ingredient quality have been produced.
- b. **The feed services laboratory at the University of Georgia has established the University as the leading center of nutritive energy determination for poultry in the western hemisphere.** The laboratory continues to make available a wide

range of laboratory analyses to enable poultry producers to effectively determine the nutritive quality of their feed.

- c. Hatch Act, Smith Lever
- d. Integrated Research and Extension

Key Theme: Adding Value to New & Old Ag Products, Agricultural Competitiveness, Agricultural Profitability

State Performance Goal: 1-9

- a. Georgia leads the nation in total commercial forest acreage with 24 million acres of commercial forests. Timber is Georgia's highest valued agricultural product and largest manufacturing sector, creating over 200,000 jobs statewide and having a total economic impact of \$25.3 billion annually. Increasing market demand for wood and paper products emphasizes the importance of strategic forest management to help Georgia companies increase output while preserving the state's forest acreage. Georgia forest resources community includes over 500,000 landowners, more than 1,500 solid wood manufacturing companies, 27 pulp and/or paper mills, and over 200,000 direct and indirect employees.

Extensive studies conducted by the University of Georgia's Center for Forest Business have shown significant inequities with regard to the taxation of timber and forest lands. Forest economics research has shown that forest industry is using only 65 percent of the logging production capacity in the region from Maine to Texas. This results in a continued loss of industrial timberland to development and other uses.

A School study shows that in recent forest product company mergers and takeovers, more than 70 percent of the deals reduced taxes for the acquiring companies, which increased profits for their investors. Pension fund investors, university endowments and other tax-advantaged entities will likely increase ownership of U.S. timberland in the future. **Unused logging capacity costs the industry nearly \$500 million per year.** Research has also demonstrated that because of land tax policies, communities unknowingly may be hurting their financial future as they try to conserve urban green space.

- b. **The School's research has brought about substantial changes to Georgia's tax assessor manual that will lead to greater equity for timberland holdings and help keep Georgia green.** Efforts focused on current use and preferential property assessment, at the county level, result in a \$60 million per year property tax savings for qualified agricultural and forest land owners in Georgia. Over 100 thousand property tax covenants on 10 million qualifying acres have earned tax savings in excess of \$300 million, to date. These current use and preferential tax

programs contribute to sustainable forest resource and agricultural enterprises, maintain green and open space, and improve water quality in Georgia.

- c. Smith Lever
- d. State Specific

Key Theme: Agricultural Competitiveness

State Performance Goal: 1-2

- a. The Dairy Head Improvement program provides dairy farmers with data so that they can base decision to improve dairy farm efficiency and profitability on factual information. The Dairy Herd management Analysis Program (Dairy MAP) was developed by UGA dairy scientists to assist dairy farmers in analyzing their herd management capabilities. The program provides on-farm consultation with interested producers. An interactive Web site uses herd summary benchmark values fro DHI herds.
- b. Programs such as Dairy MAP have contributed to the high percentage of cows enrolled in DHI in Georgia. The percentage enrolled in DHI has increased from 43% in 1985 to 64% in 2002. Georgia ranks second nationally on the percentage of cows enrolled in the program. DHI cows in Georgia produce about 48 percent more milk compared with cows in nonparticipating herds. If Georgia herds participated in DHI at the national average of 46 percent, the statewide milk loss would be an estimated \$12 million annually.
- c. Smith Lever
- d. State Specific

GOAL TWO

A SAFE AND SECURE FOOD AND FIBER SYSTEM

Food scientists, nutritionists, economists, poultry scientists, engineers, horticulturists, and others concerned with the safety of foods work together to ensure a safe and healthy meal.

Food borne illnesses continue to be a major concern for the food industry. Research and Extension programs have continued to target programs and have recorded many accomplishments toward the goal of a safe and secure food and fiber system.

The Hazard Analysis Critical Control Point (HACCP) training efforts by Extension faculty continue to be in great demand. Targeting industry employees is critical to success. UGA Extension Food Science faculty were among the first to develop a hands-on workshop using HACCP principles in the Fresh-Cut produce processing industry.

Extension faculty have presented over 30,000 educational contact hours in food handler education to 7,000 program participants. The ServSafe extension educational program has had measurable impact with commercial or institutional food handlers.

UGA scientists continue to improve efforts to fight salmonella in poultry plants. A major educational effort to minimize the risk of botulism poisoning was conducted this year with all of Georgia's community canneries which are not regulated by the state as compared to commercial canneries.

Key Theme: Food Handling, Food Quality, Food Safety, Food Security, Foodborne Illness, Foodborne Pathogen Protection, HACCP

State Performance Goal: 2-1

- a. The **fresh-cut fruit and vegetable industry** is the fastest-growing category of the U.S. produce industry, valued at over \$11 billion annually. **Increased concern over food-borne pathogens** on domestic as well as imported produce has led to many processors developing a food safety plan based on the same principles of HACCP (Hazard Analysis Critical Control Point) that the USDA has required of the meat and poultry for more than seven years.

All commercial meat, poultry, and seafood industries are required by both federal and state regulation to manufacture under a valid HACCP (Hazard Analysis and Critical Control Point) food safety system. **Individuals responsible for HACCP systems in production plants are required to attend a certified HACCP program.**

The University of Georgia Food Science Extension program offers a 3 day certified HACCP training course several times each year. While not required by

regulation, the Food Science Extension program has also developed an Advanced HACCP course that is taught once each year. In addition to these formal training programs, the Food Science Extension faculty regularly respond to questions and inquiries from HACCP coordinators in the food industry on various issues that arise pertaining to the everyday operation of their HACCP systems.

- b. A total of 58 meat, poultry and seafood **industry employees were successfully trained** this year in the principles of HACCP. All of those individuals are employed at processing operations around the state and are crucial to meeting the requirements of the applicable regulations, as well as minimizing the risk of food borne illness for their consumers.

UGA Extension Food Science specialists were among the first to develop a hands-on 2 1/2 day workshop on using HACCP principles in the Fresh-Cut produce processing industry. **Now in its fifth year as a fully accredited HACCP training program by the International HACCP Alliance, it has served as a model for many imitators, including workshops offered by the International Fresh-Cut Produce Association (IFPA).**

- c. Smith Lever
- d. State Specific

Key Theme: Food Handling, Food Safety, Foodborne Illness

State Performance Goal: 2-1

- a. **The reported incidence of food borne illness from pathogenic bacteria is increasing**; these illnesses may be life threatening or trigger chronic disease. Changing patterns of consumption, an aging population, more persons with chronic illness and wide variation in food handling and preparation practices are some of the factors contributing to increased vulnerability of the population to food borne disease. Food safety and quality concerns often put different groups within society in conflict over perceived and real concerns. Approximately 97% of documented cases of food borne illness result from the mishandling of foods in food service establishments and in the home. The resulting percentage from food service establishments alone is about 77%. With an increasing number of meals being eaten away from home, there is the potential for an increased incidence of food borne illness. Employee education and certification in the sanitary handling of food is viewed by food protection experts nationally as one strategy for reducing food borne hazards to the consumer.

County Extension Agents conducted group training programs to teach safe food handling for consumers, school children, child care providers, personal care home providers, school food service employees, restaurant employees, food

processors, and other food service or distribution professional. **County educators collaborated with relevant agencies, organizations and individuals** who deliver food handling information to the public and food service industry. Faculty provided technical expertise in food safety to Extension agents and individual or commercial clientele. County Extension educators were trained and updated in food safety issues and recommended food handling practices yearly. Training was offered in use of specific curricula, such as the ServSafe (EFNRA) food service manager certification and employee training programs. The Smart Kids Fight BAC! ® food safety curriculum was used to educate elementary school children.

University of Georgia faculty had over **30,300 educational contact hours in food handler education were provided to 7,003 program participants**. Almost 19% of the food handler extension programs were delivered to educate commercial and institutional food handlers. · The ServSafe® food safety program provided nearly 4,970 educational contact hours to 1,116 individuals. Over 54% of them were commercial or institutional food handlers. · Over 2,500 contact hours of food safety education were provided to 1,976 adult and youth consumers. · The Smart Kids Fight BAC! ® Food Safety curriculum was used to educate over 1,500 children in Georgia in 2003. · Food handler education was provided to over 1000 school foodservice employees and 344 child care providers. FACS Extension provides annual in-service training for school foodservice employees in several Georgia counties. · Media was a major strategy for food safety education; food safety articles in newsletters reached over 728,800 people; radio spots were broadcast to a listening audience of over 2.2 million; newspaper columns went to a circulation of nearly 1.5 million; television programs were targeted to over 438,700; and exhibits reached over 2,500 people.

Through the Food Safety Program at Fort Valley State University, two trainings for Extension county-based employees were implemented and one multi-state educational workshop was co-sponsored. One county agent and seven program assistants reported that they attended 49 trainings, worked with 68 volunteers, worked with 393 families, worked with 1111 adults/individuals, worked with 1205 children, made 2076 home visits, distributed 4609 publications, and conducted 106 group programs and activities. The specialist reached over 150 high school students and teachers and distributed nearly 6000 handouts and publications.

- b. **Almost 97% of the participants said that the food safety training program was helpful to understand food safety concepts. · Almost 80% of the foodservice managers who participated in the ServSafe® manager training program improved their food safety knowledge.** The comparison of their pre and post test means indicates that the knowledge improvement was significant. Nearly 83% of the managers were confident in their ability to use the gained knowledge to improve the food safety in their establishments. · Nearly 95% of the foodservice employees who participated in the ServSafe® food safety education program improved their knowledge. **The participants significantly improved**

their knowledge in five food safety areas: recognizing hazardous food situations, receiving and storing food safely, preparing and serving food safely, preventing contamination and personal hygiene. · Additionally, the participants who completed the ServSafe® food safety program emphasized their commitment to secure the safety of food. For instance, after training, a participant said, "Hold all employees to the standards that I already knew and to the standards that I learned today. They are to follow these safe-food practices 100% of the time without fail." · Comparison of pre and post-test evaluations indicates that elementary school children who participated in the Smart Kids Fight BAC! ® program significantly improved knowledge of all four Smart Kids Fight BAC! ® food safety principles - clean, separate, cook and chill. Nearly 63% of the children who participated in the Smart Kids Fight BAC! ® program improved their food safety knowledge. Almost 92% of the children who were in the Smart Kids Fight BAC! ® program, learned how to clean their hands before touching foods. · Almost 91% of the participants in food safety education programs significantly improved their food safety knowledge. · Participants in General Food Safety extension programs said that they plan to apply improved food safety practices: For instance, 88% of the participants planned to use a thermometer to test the internal temperature of foods when cooking; 94% of the participants planned to follow recommended thawing practices; 97% of the participants planned to improve their hand washing practices; 98% of the participants planned to use separate cutting boards for meat and produce; and 90% of the participants planned to reheat leftovers to a rolling boil and solids to 1650F before serving.

- c. Smith Lever
- d. State Specific

Key Theme: Food Accessibility and Affordability, Food Safety, Foodborne Pathogen Protection

State Performance Goal: 2-1

- a. During the Depression era of the 1930's, the State of Georgia started a system of "**Community Canneries**" in many of the rural counties around the state to provide people with a place to can vegetables and produce that they grew for their own subsistence. Today there are still 35 of these community canneries in use and they are operated by the Georgia Department of Education as part of the Vocational Agriculture Program. Since these facilities do not produce products for sale, they are not regulated by any state or federal agency in the rigorous way that commercial canneries are, yet the **same risk of botulism poisoning is present** if the products are not handled and processed in a safe and effective manner. Managers and workers involved in the operation of a commercial canning operation are required by law to be trained in the proper procedures for

canning, but none of the Vocational Agriculture teachers or their student workers had ever been trained as to proper canning procedures.

The University of Georgia Food Science Extension program designed, developed, and delivered a 4 day food safety training program for the operators of all 35 community canneries in Georgia. The training program was modeled after the federally mandated Better Process Control School which is the course required by the U.S. Food and Drug Administration (FDA) for all personnel involved in a commercial canning operation.

During June of 2003, a total of 93 Vocational Agriculture employees who oversee the community canneries attended a training program at the University of Georgia and were instructed in the basics of food canning equipment, proper thermal processing techniques, can seam evaluation, record keeping, and other essential topics. All 93 of the attendees passed the course exams and were certified as having been trained to operate a safe canning operation.

- b. **The community canneries around the state of Georgia are now being run by a group of individuals who have an understanding of the proper methods of canning foods so as to minimize the risk of botulism poisoning** for the people who use those canneries and consume the products preserved in them.
- c. Smith Lever
- d. State Specific

Key Theme: Food Safety, Foodborne Illness

State Performance Goal: 2-1

- a. **About 81,000 people become infected with Salmonella each year**, and poultry is often implicated as a source of these infections. The hatchery is one of the most important areas, within a vertically integrated poultry company, to control Salmonella. Studies have associated the presence of Salmonella in the hatchery with contamination among broiler flocks. **A UGA poultry scientist developed methods for sanitizing hatching eggs** using 1) a nontoxic, potable sanitizer that is applied using electrostatic sprayers and 2) chlorine dioxide gas on hatching eggs.
- b. Broiler companies are now installing electrostatic spraying systems in hatcheries and are decreasing the amount of cross-contamination during hatching as determined by the decrease in the number of Salmonella failures during processing. **These methods will prove beneficial in allowing poultry companies to continue processing and avoid plant closures (loss of a**

minimum of \$500,000 per day) because of excessive Salmonella numbers on chickens that arrive at the plant, while improving food safety for consumers.

- c. Hatch Act, Smith Lever
- d. Integrated Research and Extension

Key Theme: Food Safety, Foodborne Illness

State Performance Goal: 2-1

- a. The Centers for Disease Control and Prevention estimate that there are 76 million cases of foodborne illness each year in the United States. Because of the potential liability resulting from illnesses linked to the consumption of pathogen-contaminated fruits and vegetables, **fresh produce retailers began requesting third party certification in 1999.** This was to document that individual farms and packing/shipping facilities were using good agricultural practices to prevent contamination. Faculty in the UGA departments of Food Science and Technology and Horticulture developed a model for a cost effective, industry-sanctioned food safety certification program for Georgia growers.
- b. They developed and implemented a Georgia Food Safety Certification program. University scientists succeeded in gaining the collaboration and support of key people in a number of public and private agencies including county Extension Service agents, the Georgia Fruit and Vegetable Growers Association, the Georgia Crop Improvement Association and the Georgia Department of Agriculture.
- c. Smith Lever
- d. State Specific

GOAL THREE

A HEALTHY, MORE WELL-NOURISHED POPULATION

The leading causes of diet-related morbidity and mortality in the United States and in Georgia today include heart disease, cancer, stroke, and diabetes, ranked respectively from most prevalent to least prevalent. Other significant diet-related public health concerns include osteoporosis and obesity. Statistics show that a disproportionate burden of diet-related disease is borne by minority, low income, and educationally disadvantaged persons. Extension faculty have developed many programs and educational efforts to address these issues.

A comprehensive diabetes education program reached over 5600 Georgia citizens last year. Evaluations show that 89% of these program participants improved their habits and learned better how to control diabetes.

The Expanded Foods and Nutrition Educational Program (EFNEP) and the Family Nutrition Program (FNP) enjoyed great success and impact on the families involved in the program. County agents had impacts with many local programs targeting families and youth with healthy lifestyle education.

Key Theme: Human Health, Human Nutrition

State Performance Goal 3-1

- a. The leading causes of diet-related morbidity and mortality in the United States and in Georgia today include heart disease, cancer, stroke, and diabetes, ranked respectively from most prevalent to least prevalent. Other significant diet-related public health concerns include osteoporosis and obesity. Statistics show that a disproportionate burden of diet-related disease is borne by minority, low income, and educationally disadvantaged persons. These groups have higher rates of hypertension, stroke, diabetes, and other diseases than the general population. Most of these diseases also occur more frequently with advancing age. According to the Georgia Department of Human Resources, **411,000 adults were diagnosed with diabetes in Georgia in 2001**. For every two people diagnosed with diabetes, it is estimated that another person goes undiagnosed. That means 633,000 adults could have diabetes in the state of Georgia. During the 1990s, diabetes moved up from the seventh leading cause of death to the sixth leading cause of death in Georgia. It is estimated that \$1 billion could be saved in medical care costs due to complications of diabetes if nutrition education were a routine part of diabetes management.

The University of Georgia Cooperative Extension Service offered a comprehensive diabetes education program. This includes intensive training for county Extension agents in nutrition issues related to diabetes, a quarterly

newsletter focusing on diabetes, the Rite Bite Cooking School written by Extension specialists and conducted by county Extension agents, and a diabetes management program conducted locally by county Extension agents and cooperating hospitals, health departments, and physicians. Recipes which teach lesson concepts were demonstrated and sampled. Developed the Focus On Diabetes self-study CD program to those affected by diabetes. The Walk-a-Weigh nutrition and exercise curriculum was developed and delivered to help people control their excess body weight by practicing regular exercise and healthy dietary habits. Fitness was emphasized, and walking was an integral part of the program.

Diabetes education programs provided over 9,980 hours of diabetes control and prevention instruction to 5,620 Georgians in 2003. Nearly 36% of the participants were low-income Georgians. · Nearly 463 Nutrition and exercise extension programs were conducted for over 6,000 adults and youths. · Media was a major strategy for public diabetes education in Georgia: diabetes articles in newsletters reached over 52,440 people; radio spots were broadcast to a listening audience of over 804,100 people; newspaper columns went to a circulation of over 692,900 and television programs were targeted to over 328,000 viewers; exhibits reached over 13,950 people.

Collaborations in this effort included the following programs and organizations: Centers for Disease Control and Prevention, American Diabetes Association, USDA Food Stamp Program, West Virginia Cooperative Extension Service, American Diabetes Association, Georgia affiliate, Medical College of Georgia The University of Georgia Departments of Foods and Nutrition and Health Promotion and Behavior, Georgia Department of Human Resources, Office of Nutrition. Georgia Department of Human Resources, Diabetes Control Program

- b. **Almost 89% of Georgians who participated in diabetes education programs said those sessions were very helpful for them to learn how to control diabetes by practicing healthy habits.** Most of the participants planned to adopt learned healthy habits. For example, 90% planned to follow a meal plan to control their carbohydrate intake; 96% planned to use artificial sweeteners to control their sugar intake; 69% planned to modify their recipes to cut sugar, fat, and sodium; 67% planned to have their blood pressure checked regularly; and 97% planned to read nutrition labels.

The comparison of pre and post evaluations of the Right Bite Diabetes Cooking Schools program shows that 57% of the participants improved their overall dietary behavior. A habit survey conducted with the Right Bite Diabetes Cooking Schools participants indicates that most of them started healthy nutrition habits to manage their diabetes. For example, 77% used low-fat and non-fat dairy products daily; 67% ate at least three vegetables daily; and 66% ate fish and seafood at least twice a week. Almost 47% of the participants planned to use the diabetes recipes to control their diabetes and improve health.

The comparison of pre and post evaluations of the children who participated in the Building Healthy Bodies extension program significantly improved their food and nutrition knowledge. Above 80% of the children who completed the program developed their ability to identify foods from the five food groups of the Food Guide Pyramid.

The comparison of pre and post evaluation data shows that most of the participants who completed the Walk-A-Weigh nutrition and exercise extension program significantly improved their dietary and exercise habits. For example, 51% of the participants started the habit of doing exercise at least three times a week for 30 minutes at a time; 63% made a conscious effort to limit fat to 30% of total calories; 67% started eating at least three vegetables each day; 60% started eating low-fat snacks and desserts; 55% started to trim fat from meat to reduce fat intake; 63% modified recipes to lower fat by using low-fat ingredients; 58% started to read nutrition labels to help make healthy food choices; and 49% of the participants improved their exercise habit.

Follow up clinical and medical data of Walk-A-Weigh participants show that the six-week extension program significantly helped them improve their health condition by reducing the risk factors. For example, 85% of the participants were able to reduce their excess body weight by an average of 5 pounds; 67% were able to decrease their blood glucose level; 56% were able to reduce high blood pressure; and 45% were able to decrease their total cholesterol level.

- c. Smith Lever
- d. State Specific

Key Theme: Human Health, Human Nutrition

State Performance Goal: 3-2

- a. It is also important to recognize that hunger exists in Georgia. **Almost 15% of the population is at or below the poverty level. As a result, many people lack the quantity and quality of food for adequate nutrition.** There is a growing recognition that hunger and food security do not exist in isolation. Poverty and related problems that affect families and communities cause hunger. The societal conditions, which sustain the problems of hunger and jeopardize food security are known globally. However, the relationships among the issues that endanger food security and create hunger in a community are often not understood. Hunger compromises the ability to learn because it reduces the ability of a child to concentrate. Undernutrition during pregnancy can result in low birth-weight infants who are more likely to require intensive medical care after birth and special education services, and infants with neural tube defects resulting from

insufficient folic acid. Nutrition education programs enable families and individuals to make food selection and preparation choices that are consistent with their lifestyle and cultural practices and enhance their health status. These programs enable families with limited resources to get the most nutritional value for their food dollar. In the long-term, nutrition education programs benefit families and individuals, and therefore society, by improving overall health and well-being.

Under the **Expanded Foods and Nutrition Education Program (EFNEP) and the Family Nutrition Program (FNP)** following actions were taken: · Trained paraprofessionals in low-income communities to teach nutrition to hard-to-reach audiences using culturally-appropriate methods and materials. · Educated families on planning low cost nutritious meals in order to maximize the nutritional value of their diets and decrease the number of families who run out of food before the end of the month. · Taught limited resource clients how to modify their diets to decrease the risk of chronic diseases. · Provided food safety education for limited resource clients. · Provided nutrition education to teenage mothers in order to increase maternal weight gain and intake of crucial nutrients.

In FY 2003, through the adult program, **EFNEP reached a total of 12,412 individuals in 3,258 families.** · In FY 03, 10% of EFNEP clients were pregnant at the time they were enrolled in the program. Eight percent were under the age of 20 and pregnant and/or nursing, for a total of 253 women. · **A total of 8,458 youth were reached through the EFNEP food and nutrition program.** Of those, 17% were white, 77% black, 3% Hispanic, 1% American Indian, and 1% were Asian. · Over 400 nutrition class series covering topics such as food safety, meal planning, healthy food choices, nutritious snacks, food budgeting, and healthy cooking techniques were held for the food stamp eligible clients. · **Over 248,550 hours of foods and nutrition education were provided to 83,054 Georgians in 2003.** Almost 77% of the participants were low-income Georgians. Extension Agents delivered over 69 food and nutrition educational programs such as Food Fun and Reading program to young children. Extension Agents organized and facilitated Food Buying and Meal Planning nutrition extension programs for over 1100 FNP clients in 2003. Media was a major strategy for Family Nutrition Program in Georgia. Food and nutrition education was provided through 109 TV presentations to over 2.5million people, more than 485 radio broadcasts to over 3.8million listeners, 403 newspaper articles to over 5million, and 14,211 health fairs and exhibits to 72,800 people. More than 2,620 newsletters reached over 403,000 people.

- b. A total of 2,169 people graduated from the EFNEP program in FY 2003. As a result of the EFNEP program, 28% of participating families enrolled in the Food Stamp program. In addition, 19% enrolled in WIC and 15% began participating in the child nutrition program (free and reduced price school lunch). **After completing the EFNEP program: o 90% of EFNEP graduates had a positive change in the nutritional value of their diets; Georgians who graduated from**

EFNEP saved approximately \$11.30 per family per month on food; EFNEP participants' total fruit and vegetable consumption increased by 30%; 57% of participants showed improvement in one or more food safety practices, such as thawing and storing foods properly; 78% improved one or more food resource management practices, including planning meals, using grocery lists, comparing prices, and not running out of food; 81% improved nutrition practices such as making healthy food choices, preparing foods without adding salt, reading nutrition labels, and eating breakfast.

Most of the Georgians in food buying training learned to buy nutritious foods with very limited resources. Nearly 60% said that they are going to use the unit price to compare food products. **Over 93% of the FNP clients who participated in the Meal Planning Nutrition Education Program said that it was helpful to learn healthy meal planning concepts and practices.** The majority of the participants who completed the program learned to adopt healthy meal planning and dietary practices. For example, 78% indicated that they make sure they eat at least five fruits and vegetables each day; 69% indicated that they plan to eat low-fat snacks and desserts; 64% indicated that they plan to eat at least two servings of low-fat dairy products each day; 63% said that they plan to include at least one new fruit or vegetable in their diet; and 62% said that they plan to eat chicken without skin.

Nearly 96% of the participants who completed the Food Buying Education Program said it was helpful to learn how to buy nutritious foods with limited resources. Most of them said that they plan to apply learned food buying practices. For example, 79% said that they intend to use the Food Guide Pyramid in planning balanced meals; 61% said that they plan to use the unit price to compare products; and 56% said that they plan ahead for meals.

Nearly 80% of the children who participated in the Professor Popcorn nutrition education program improved their food and nutrition knowledge. The children significantly developed their ability to identify foods from different food groups of the Food Guide Pyramid.

- c. Smith Lever
- d. State Specific

Key Theme: Human Health, Human Nutrition

State Performance Goal: 3-2

- a. Leading causes of diet-related morbidity and mortality in the U.S. today include hypertension, heart disease, cancer, stroke, diabetes, osteoporosis, and obesity. Research has shown strong and consistent patterns of relationship between diet

quality such as rich in fruits and vegetables and lowered risk of a number of chronic diseases. The U.S. Dietary Guidelines and the Food Guide Pyramid, as well as other national disease prevention recommendations, advise individuals to consume five or more servings of fruits and vegetables each day. In addition to the positive reports on fruits and vegetables, many clinical and experimental studies support a role for dietary fiber, trace elements, vitamins, and other components of whole grains in reducing risk for chronic diseases such as cancer and coronary heart disease. **As a result of the increase number of chronic diseases, nutrition education programs are needed.** The primary benefit of implementing a Nutrition Program for clients with chronic diseases is that the information and resources help to improve their quality of life, while reducing the economic costs associated with chronic diseases.

At Fort Valley State University a nutrition program to address the chronic diseases was developed. Major components of the program are the Food Guide Pyramid, Hypertension Resources, Heart Disease Resources, Cancer Resources, Diabetes Resources, Obesity Resources, Exercise Resources and various nutrition, diet and health resources. Curriculums were adopted, exhibits were designed and purchased, resources were purchased, and publications were written and published. Through the Nutrition Program: Two trainings for Extension county-based employees were implemented and one multi-state educational workshop was co-sponsored. One county agent and seven program assistants reported that they attended 69 trainings, worked with 88 volunteers, worked with 817 families, worked with 1,363 adults/individuals, worked with 3,189 children, made 3,372 home visits, distributed 9,554 publications and handouts, and conducted 175 group programs and activities. FVSU specialists reached over 200 individuals in group meetings and distributed nearly 20,000 publications and handouts.

- b. Campus and county-based employees reached a reported 1,503 clients. Programs were implemented at schools, churches, home and other sites on basic nutrition, diet, exercise and chronic diseases. All of the programs focused on improving nutrition and health. One county agent and seven program assistants reported that 34% or 511 clients improved their nutrition behavior, 30% or 457 clients changed their eating habits and were exercising more, and 36% or 535 clients are practicing healthy lifestyles. In addition, there are 803 clients that the county-based employees are regularly working with. **By working with these 803 clients, county-based employees identified 29 current nutrition and health related issues and concerns in their counties that they are working to address.**
- c. Smith Lever
- d. State Specific

Key Theme: Human Health, Human Nutrition

State Performance Goal: 3-2

- a. **About 20 percent of all children in this country are overweight.** This alarming trend is leading to cardiovascular disease, high blood pressure and high cholesterol in children at younger ages. All of these problems should alarm parents, yet many of these parents live the same lifestyles that have brought about these diseases in their children. County Extension Service agents offer various approaches to educating children and their parents on living healthy lives.
- b. In Tift County, the agent worked with a community-wide collaboration to plan Care For Kids Day, a children's health fair. The fair reached more than 1,100 participants in eight counties. **Health screenings found that 25 percent of participants needed further vision testing.** Six children tested positive for scoliosis and 50 participants were screened for diabetes. One parent said, "I had no idea of all the health problems my young child could face."

In Treutlen and Toombs counties, the agent taught two series of five nutrition workshops to 140 kindergarten and first-grade students. The objectives of the program were to increase the variety of foods eaten, to add more fruits and vegetables and to choose lower-fat snacks. **The program had a significant impact on the children's food and nutrition knowledge in both counties.**

Agents in Crisp, Clinch and Lowndes counties collaborated to receive the Kraft Consumer Media Grant Award from the Georgia Extension Association of Family and Consumer Sciences. They developed a nutrition program targeting middle school children using the theme of the television show "Survivor." **The program focused on teaching the basics of the food guide pyramid and the importance of the nutrients found in each food group and the effects on the body.**

- c. Smith Lever
- d. State Specific

GOAL FOUR GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT

University faculty continue to work diligently in the area of agriculture and environmental harmony. Each year brings more pressure to increase understanding and to find new solutions. The work documented in this report highlights some of those accomplishments in agricultural waste management, soil quality, and sustainable agriculture.

The issue of water -- quality, quantity, regulations, use and availability -- is at the top of the agenda of almost all city, county and state governing bodies. Trying to anticipate future needs and resources, they call on experts in agriculture and environmental sciences at the University of Georgia and Fort Valley State University. The state of Georgia instituted state-wide water use restrictions in 2001 for the first time in history. Georgia, Alabama and Florida are currently in legal disputes over water rights of major rivers.

Research on variable-rate irrigation control systems has the potential to save as much as 30% of the water use on Georgia's 9,500 center pivot irrigations systems covering over one million acres.

Improved methods of DNA fingerprinting of pollution sources has proven to be successful in several Georgia situations in which Extension faculty were involved. Removing scrap wallboard gypsum from the waste stream is another example of environmental efforts. Scrap wallboard is estimated to be 26% of new home waste. Extension faculty are sharing research results that demonstrate the use of this waste agriculture.

The Georgia Environmental Protection Division and Georgia Department of Agriculture ask the Georgia Extension Service to bring the expertise and experience of its faculty to help farmers meet the new regulations of the Animal Feeding Operation (AFO) and National Pollution Discharge Elimination System (NPDES) programs administered by EPD.

Environmental education programs and agricultural awareness programs are critical to prepare today's young people to understand and support sound practices that protect our environment while maintaining the safe and bountiful food and fiber system enjoyed by American's today. Georgia Extension is doing its part to prepare today's youth to be decision makers of tomorrow.

Key Theme: Water Quality

State Performance Goal: 4-2

- a. **People concerned about water quality are often interested in identifying sources of fecal contamination.** For example, is the fecal contamination in a local river from humans or wild animals? **With certain DNA-based methods, it is now possible to identify these sources;** this is called bacterial source tracking. Most of these methods involve isolating specific fecal bacteria from the contaminated water and from a variety of different warm-blooded animals. The DNA "fingerprints" of the bacteria from the water match one or more of the host sources, then the source is identified. **The problem with this method was that the DNA of the specific fecal bacteria varied too much over time and geography to get a lot of matching.**

Targeted sampling was developed to solve this problem. Targeted sampling has four steps. The first step is to sample the entire area of contaminated water, collecting between 50 and 100 water samples in one day. It is important to do this sampling when it is not raining, because runoff affects the results. Fecal contamination is plotted on a map and hotspots are identified. The second step is to talk with local citizens, concerned groups like Adopt-A-Stream, and state agencies, about these hotspots. If a specific area is identified, often these persons or agencies have a good idea where the fecal contamination is coming from. The third step is to combine this local knowledge with another sampling, only this time in the area around the hotspots. Numbers of fecal bacteria can be either high or low. Low counts are likely transient sources of fecal contamination; high counts are likely persistent sources. Transient sources can usually be ignored, but persistent sources are important. If a persistent source is something like a pipe, then there is no need for further sampling because the source is obvious. However, if the source is not obvious, then this requires the fourth step, bacterial source tracking. Here the potential host animal sources and the contaminated water are sampled in one day around the persistent source. Because the number of sources of fecal contamination is small and the sampling is done in one day in a limited area, it is a lot easier to get good DNA matching.

- b. Targeted sampling was tried on the Sapelo River on the Georgia Coast and it worked well. Almost half of the fecal contamination in this tidal river came from a failing private wastewater treatment facility. This facility is now fixed. Targeted sampling made the site easy to identify. For bacterial source tracking, the bacteria did not vary so much with regard to time and geography, and it was easy to get good DNA "fingerprint" matching. **Targeted sampling is also a lot less expensive and time-consuming than the original method. Targeted sampling is now being adopted by several Georgia Regional Development Centers to identify sources of fecal contamination.**
- c. Hatch Act
- d. State Specific

Key Theme: Soil Quality

Goal 4-1

- a. **Georgia has a goal of reducing solid waste going to landfills by 25%.** To meet this goal, alternative uses for many of our wastes need to be developed. **Residential construction is a major waste generator** in the state. Some of the materials used in construction may be able to be reused onsite, which would reduce the amount of waste going to a landfill. **Scrap wallboard is estimated to be 26% of new home waste.** Wallboard is made of calcium sulfate (gypsum) with a paper backing. Gypsum has long been used in agriculture as a source of calcium and sulfur, and to improve the physical characteristics of certain soils. Beneficial reuse of this material can reduce waste going to the landfill and potentially improve construction site soils. The Georgia Department of Natural Resources Commercial and Industrial Solid Waste Program was interested in allowing beneficial reuse of scrap wallboard gypsum in residential lawns and landscaping, but needed guidelines for beneficial reuse.

A committee of faculty from Horticulture, Crop and Soil Science, and Biological and Agricultural Engineering worked together to develop guidelines for beneficial reuse including recommended practices and application rates. The result was two extension bulletins - On-Site Beneficial Reuse of Scrap Wallboard in Georgia Residential Construction and Guidelines for On-Site Use of Scrap Wallboard in Georgia Residential Construction. The bulletins were reviewed by the Commercial and Industrial Solid Waste Program and they agreed to promote beneficial reuse if these recommendations are followed. **These bulletins are the first in the nation to describe recommendations for beneficial reuse of scrap wallboard gypsum.** External funding was obtained from the Georgia Solid Waste Trust Fund to have hard copies of the bulletins printed

- b. The bulletins have received considerable interest with requests for information coming from as far away as Ontario, Canada. They were distributed at the Greenprints Building Conference in January of 2003. They have posted on the USEPA website for green building information and the BuildAmerica website. We have also received requests for information from the WasteCap Wisconsin group. Current estimates are that about 34,000 new homes are constructed each year in Georgia. If an average home is assumed to be 2,000 square feet then as much as 51,000 tons of residential scrap wallboard gypsum is generated each year. **As builders become more interested in green building the guidelines developed have the potential to remove much of this wastestream from Construction and Demolition landfills.** In addition, research on the agricultural use of gypsum shows that it can reduce soil crusting and help improve infiltration. The use of ground wallboard gypsum on the construction site may help reduce stormwater runoff and erosion.
- c. Hatch Act, Smith Lever

- d. Integrated Research and Extension

Key Theme: Agricultural Waste Management

State Performance Goal 4-1

- a. **An abiotic disease called black root has devastated cotton production in many flatwoods soils in SE Georgia for the past 7 years.** By 2000 we had proved the value of broiler litter for alleviation of black root. Currently, cotton farmers in the flatwoods are applying broiler litter extensively, but the supply in the vicinity is limited and transportation from the north Georgia supply is expensive.

Field studies were conducted on five flatwoods sites in 2001 and 2002 to determine the residual effects of broiler litter on black root of cotton. Field studies were conducted to determine if fertilizers or other available amendments could control black root. Greenhouse and field studies were also conducted to determine the ingredient in broiler litter responsible for the correction of the disease.

- b. **For the first time in 7 years, there were no reports of black root in 2003, indicating the effectiveness of broiler litter applications.** A single 4 ton/acre application of broiler litter is effective for 2 years. Farmers needing it for the control of black root will, in the future, be able to only apply it each 2 years and thereby likely obtain enough locally at lower cost than it presently costs for its transport from N Georgia. Cotton gin trash application at high rates had some effects in controlling black root, but was not as effective as broiler litter. The uric acid and roxarsone components of the litter are under evaluation, in order to find a more convenient and lower cost alternative to application of broiler litter. **This research has been effective in raising lint yields several fold, where black root has been a problem in extensive areas of the flatwoods.**

- c. Hatch Act, Smith Lever

- d. Integrated Research and Extension

Key Theme: Agricultural Waste Management

State Performance Goal: 4-1

- a. In agriculture, **animal manures are often considered to be the unwanted byproducts** of production and processing. Because of this, these materials are often considered to have little or no economic value. However, these organic waste streams contain compounds with potential value to the farmer and society.

The nutrient value of poultry manure produced annually in Georgia has a value of more than \$60 million. UGA agricultural scientists in engineering and poultry science developed an alternative manure management system for caged layer systems which allows for composting of deep stacked manure within the house. **In-house composting is an alternative manure management technique** in which layers at commercial densities deposit their manure onto stacked litter materials located directly beneath the cages. Over the past year, tests were conducted in which an entire manure pit was littered with a carbon source and composting of the manure within an entire house was studied. During the first three months of testing, only a limited amount of composting occurs because of a lack of manure buildup within the carbon source. However, once this initial period is over the volume of manure and compost increased only slightly with time.

- b. **At the end of the 331-day test period, the volume of manure within the test house was about 60 percent that of an adjacent house in which composting had not been performed.** Based on the volume and bulk density measurements, the total weight of compost estimated to be in the house was 500 tons. **The composted material was dryer, had better handling characteristics and less odor than raw manure.**
- c. Hatch Act
- d. State Specific

Key Theme: Weather and Climate

State Performance Goal: 4-10

- a. **Global warming due to increase in CO₂ and other green house gases in the atmosphere is of great concern to all.** Researchers are making intensive efforts to develop methodologies to mitigate global warming. Towards this direction, the role played by forests and agricultural crops in sequestering carbon is being investigated all over the United States and other parts of the world. **Our role is to help reduce the uncertainties in carbon estimates and interpret the results correctly with regard to the ecosystem of interest.** The South East of the US, Georgia and North Florida specially, is of particular interest because the potential to mitigate climate change is greater than in most other regions of the US. This is because Georgia has the largest concentration of private forests land of the US, and the size of the average acreage is largest, and because vegetation grows year round in contrast with other regions such as the Mid West or the North East with relatively small growing season.

The diffusion and transport of gases and their sources and sinks within and above the canopies are studied with the help of mathematical models and data from

measurements. A managed 12-year old slash pine plantation located at Gainesville, Florida was selected for the study as it is one of the AmeriFlux sites in the South Eastern United States where carbon sequestration measurements are already taking place. **In collaboration with scientists from other universities and national laboratories, several intensive measurement campaigns were conducted with the help of slow and fast response micrometeorological instruments, gas analyzers, atmospheric tracers and remote sensing equipments.**

- b. The data collected using various types of instrumentation is analyzed to study flow patterns within and above the canopy at the experimental site. The relative contributions to gaseous fluxes from sources and sinks at different heights of the forest canopy and from varying diffusion distances are revealed from the tracer flux and concentration measurements. The net gaseous exchange and concentration contributions vary with atmospheric stability, with the sources and sinks located near the measurement points contributing more during unstable conditions whereas far away sources and sinks have significant effect during stable conditions. **These studies will help to segregate the contribution to carbon sequestration from co-located diverse ecosystems.** It is also noticed from the study that flow circulation and gaseous transport from forest clearings located several hundred meters away from the measurement location influences the measurements, leading to erroneous carbon estimates and misinterpretation of the actual scenario. The mathematical models are validated against the measured data.
- c. Hatch Act
- d. Multistate Research: GA, FL, CA

Key Theme: Water Quality

State Performance Goal: 4-2

- a. **About 75 percent of new homes built in Georgia use on-site sewer (septic) systems** instead of central sewer to manage household wastewater. Conventional on-site system drainfields use pipe and gravel in trenches to distribute the wastewater over an area of soil. In recent years, **alternative drainfield designs have been developed that do not use gravel**, and one of these is a chamber system. UGA crop and soil scientists have been testing the claim that chamber systems have twice the infiltration rate of conventional systems due to the absence of gravel in the trench. They used a two-dimensional computer model to simulate water movement from the bottom of a trench into a clay soil using hydraulic properties of a typical Piedmont soil.

- b. **UGA scientists found that the infiltration rate in the chamber system was 1.1 to 1.4 times greater than the conventional systems** (depending on the position of the gravel particles), **well short of the two-fold increase claimed by the manufacturer.** The reason for the discrepancy is that the analysis by the manufacturer fails to account for the accelerated flow of water between gravel particles and lateral flow into the soil directly below the gravel particles.
- c. Hatch Act
- d. State Specific

Key Theme: Water Quality

State Performance Goal: 4-2

- a. **The states of Alabama, Florida, and Georgia currently dispute the apportioning of water** from rivers that originate in Georgia but flow through all of these states. It is not known how much water is used in each state. **Water estimates are not reliable, because of the type of surveys that are conducted to collect data on irrigated area.** Hence the conflicting parties don't believe each other's data and therefore it is difficult to settle the water dispute which has been going on for about a decade.

The NOAA/NESDIS funded a project (through Grant No. NA16EC2373) conducted at the University of Georgia to examine potential of AVHRR satellite data to detect irrigated area so that accuracy of irrigated data can be improved and the data can be made available on real time basis. Under this project both regression and pattern recognition techniques were used for two agricultural regions of Georgia: Baker and Mitchell (BM) counties and Seminole and Decatur (SD) counties. Two AVHRR-based variables, Normalized Difference Vegetation Index (NDVI) and Vegetation Health Index (VHI), were regressed against the irrigated area for the study regions to find out the relationship between them. In addition, discriminate analysis as well as nearest neighbor approach was applied on bi-weekly composites of NDVI data for 2000 to separate irrigated and non-irrigated area. The NDVI data were collected from the EROS data Center, Sioux Falls, South Dakota.

- b. **The Vegetation Health Index (VHI) was found to be related to irrigated area more significantly** than the Normalized Difference Vegetation Index (NDVI). In the case of VHI, R² was 0.84 for the BM region and 0.83 for the SD region. In the case of pattern recognition / discriminate analysis approach, it was concluded that the pre-sowing or post-harvest period was the best for detecting irrigated lands

using NDVI data. Analysis of data for additional sites and years is recommended to achieve greater reliability of results.

- c. Smith Lever, Hatch Act
- d. Integrated Research and Extension

Key Theme: Water Quality

State Performance Goal: 4-2

- a. **The state of Georgia instituted state-wide water use restrictions in 2001 for the first time in history.** These restrictions limited the time when water could be used for landscape and turf irrigation and other outside water uses. Additional water use restrictions were implemented in many communities based on expected depletions of existing water supplies. In some cases, outside water use was restricted "24 hours a day - 7 days a week", which implies that no landscape plants or turf could be irrigated. In 2003, the restrictions were changed once again; making it difficult for water users to know how to manage their irrigation. Two of the most thriving and dynamic industries in Georgia today are landscape and nursery operations with millions of dollars spent to develop and improve existing landscapes. **The potential to irreparably harm such industries through massive water restriction practices that might be prevented is the primary goal of this particular project.** Small communities are most susceptible to poor landscape irrigation practices because they rarely have the infrastructure or funds to effectively improve their systems and management practices.

In 2001, the University of Georgia embarked on a pilot study in Douglas, Georgia to develop a mobile laboratory approach to improving the efficiency of landscape irrigation practices and reducing overall water use. The idea behind the mobile laboratory was to "move into" a community for a period of time (a few months), do a study and provide reports on how the community could save water. The laboratory would then proceed to a new community. The contact approach, data being collected, report structure, and presentation information were all developed through this project.

- b. The pilot study in Douglas, Georgia involved the local extension specialist and evaluation of over 7% of the outside irrigation (metered) water users. The monitored sites were split evenly between homeowners and municipal/business locations. **Results from the pilot study indicated that about 20% of the water currently being used for landscape and turf irrigation could be saved with system or management improvements.** The primary needs included: installing the proper nozzles on rotating sprinklers that did not cover an entire circle, matching application amounts between spray head and rotating sprinkler zones, fixing leaks, eliminating off-site applications, improving zone management with

low water use plants, using different application amounts based on seasonal plant needs (fall, winter and spring), and taking advantage of technology advances to "turn systems off" if sufficient water is already available to the plants (from irrigation and rainfall). The mobile laboratory concept can be implemented on a regional or state-wide basis with appropriate funding. The ability to involve "everyone" in water conservation alternatives is essential to a water conservation ethic and buy-in by all users. If we expect to meet water resources needs both now and into the future, water management alternatives must be explored that have a minimal impact on our quality of life.

- c. Smith Lever
- d. Multistate Extension: GA, FL

Key Theme: Water Quality

State Performance Goal: 4-2

- a. Even though Georgia is no longer experiencing drought conditions, water conservation remains a critical issue for the state. In the last irrigation survey (2000), over 1.5 million acres of agricultural land were irrigated with an average of 7.2 inches of water being applied. This means over 290 billion gallons of water were estimated to be used to irrigate crops. **In Georgia, there are over 9500 center pivot irrigation systems accounting for over 1 million acres** of irrigated farm land. Many of these center pivots do not make full circles and/or apply water to non-cropped areas. A preliminary survey estimates that at least **30 % of the center pivot systems had non-cropped areas being watered**. One way to conserve water is to make irrigation systems more efficient.

The University of Georgia CAES Precision Agriculture team has partnered with an Australian company, Farmscan, to develop a user-friendly and reliable/robust variable-rate irrigation (VRI) control system. Four VRI systems have been installed on grower-owned pivots and two have been installed on UGA pivots (including at the UGA CAES Stripling Irrigation Research Park near Camilla) and three more installations are in the planning phase. The UGA Precision Ag Team has performed hardware testing of each of the installed systems and more extensive testing of their long-term value is ongoing.

- b. **Each pivot equipped with VRI control requires specific management zones with differing water requirements. Many of the installed systems could potentially provide substantial water savings over normal application methods.** For example, an 87-acre pivot in Screven County equipped with VRI controls (with control zones delineated by the grower) would potentially save 7.5% of normal water applied, or about 7.1 million gallons over five years (based on an average of 8 inches of water applied per year). A 160-acre VRI pivot in

Cook County would potentially save 8.1% of normal water applied, or about 14.2 million gallons over five years. Actual water use testing was conducted on two of the farmer-operated VRI systems. A 30-acre pivot in Colquitt County saved 36% of normal water applied, or about 14.5 million gallons over five years. A 32-acre center pivot in Baker County applied approximately the same amount with VRI controls as with normal application methods - however, no water was wasted and optimal amounts of water were applied to the appropriate areas. Cost-share incentives are expected to create real opportunities to allow extensive farmer adoption of VRI technologies for significant water savings in the future. If cost-share monies could be applied to this technology, growers could more easily install these systems, enhance yields, and save water.

- c. Hatch Act
- d. State Specific

Key Theme: Water Quality

State Performance Goal: 4-2

- a. Since the Clean Water Act was signed 30 years ago, point source pollution has declined, but water quality goals are still not being met. Non-point source pollution impacts are now recognized as being the major contributor to water quality problems. This non-point source pollution can be easily seen by the youth of today through cloudy streams after rainfalls to algae growth in small creeks and streams. In the past, pollution prevention and water quality education has been mainly geared towards adults; however, we have to look towards the future and educate our youth on pollution prevention measures. Through this process, they also need to be made aware of how their actions impact water quality in a positive or negative way.

To meet the need for youth water quality programming, the Ag Pollution Prevention (AgP2) program has developed and implemented "FUN with Pollution Prevention" activities. These activities are designed to involve our stakeholders (youth, teachers, Georgia citizens, citizens of other states) in hands-on activities that teach them about preventing non-point source pollution. The program has grown through contact with County Extension staffs, promotion by College Personnel, request by school groups, presentations at conferences and presentations at field days. The youth contact has occurred through cluster 4-H groups, school groups visiting the Coastal Plain Experiment Station, and school science clubs whom are interested in pollution prevention and water quality. The program gives stakeholders hands-on opportunities to see how activities on the land impact our water bodies both above and below the ground surface. These activities involve tools such as a rainfall simulator, surface water models, groundwater models, and 'Low-Cost' water monitoring kits. The models are used

in various locations from the classroom to cotton fields and allow those involved to 'contaminate' the surface and ground waters through normal daily operations such as fertilizing yards, construction activities, and farming operations. The "Low-Cost" monitoring kit provides an opportunity to work with small groups or individuals to collect and analyze water samples from local streams. The activities also incorporate topographic maps, watershed maps and schematics to show how water moves across the surface and underground and to allow the participant to understand impacts in their communities.

- b. This program provides the stakeholder with a hands-on opportunity to examine pollution prevention and how that water is affected by their and others everyday activities. In the last year the program has been presented to over 500 persons at conferences, field days, Sunbelt Expo, and classrooms. **The hands-on opportunity provided by these models, kits and activities provides immediate results through questions and stories, but should also provide a 'seed' of the importance of protecting our water resources.** The models have been used by the AgP2 group to present pollution prevention to over 5,000 persons at various locations and presentations. Other than the presentations by the AgP2 group, the models and equipment has been loaned out for use at Community Water Days, Ag Awareness days, county Extension offices for 4-H programs, adult education; and other field days. Some additional impacts from the models is: At least 10 persons have requested plans for the rainfall simulator for use in County Erosion and Sediment control programs, 4-H projects and County Extension programs in other states. Students have been able to provide the presenter using the Surface Water model with a detailed description of what the model is used for, what the different sources of non-point pollution are, and some of the other details usually explained with the model even after a year or more has passed.
- c. Smith Lever
- d. State Specific

Key Theme: Agricultural Waste Management

State Performance Goal: 4-2

- a. Livestock farms are under increasing public pressure for the perceptions of their environmental impact. Regulations pertaining to agricultural operations are making it increasingly difficult to comply. Farm operators are managing their operations, not just for profit, but also to reduce environmental impacts. In other industries, environmental management systems, such as those approved by the International Standards Organization under the name ISO 14000, have been used to improve environmental as well as economic performance. These systems are largely untested in agricultural settings.

The University of Georgia, in conjunction with nine other land grant Universities, received funding to develop and evaluate the use of livestock environmental management systems (EMS). **In this project, a national framework and process for implementing environmental management systems on livestock operation was developed and tested** to determine which approaches provided the most benefit and establish partnerships to promote the use of these systems. Environmental assessments and guidebooks for developing and implementing EMSs were developed for dairy, beef, and poultry operations. (See <http://www.uwex.edu/AgEMS/livestock/>) **Georgia served as the lead State for poultry** and 21 farmers were selected to participate in the pilot project. Each of these farmers developed and implemented an environmental management system on their operations. Pre and post surveys were used to determine impact and improvements through the use of these systems. A statewide stakeholder meeting was held in October, 2003 to obtain further input on the use of EMSs in Georgia and plan for future educational outreach activities.

- b. While the project is on-going and the results at the state and national level are still being analyzed, the project impacts have included greater awareness for environmental issues both on the farm and within participating organization. The development of more than 20 farm level environmental management systems (EMS), and establishment of a statewide team to further pursue EMS development and use in Georgia are positive benefits. Consultants charge from \$5,000 to \$15,000 to assist most industries with EMS development and this project developed tools that extension agents can use to accomplish the same tasks. **Many of the participating farmers made several changes on their operations to reduce environmental impacts and have developed long term plans to continue to monitor and correct their farms to insure that future impacts are prevented.**
- c. Smith Lever
- d. Multistate Extension: GA, PA, VA, NY, ID, WI, MT, IA, TX

Key Theme: Water Quality, Agricultural Waste Management

State Performance Goal: 4-2

- a. Previous research at the University of Georgia has shown that mature riparian (streamside) forests protect stream water quality by intercepting and retaining nutrients and sediments leaving fields and pastures. Because of this, federal cost-share programs now include incentives and rental payments for landowners to restore riparian areas and replant them to forest. However, **no scientific evidence existed to verify that newly restored riparian areas can also be effective in intercepting and retaining nutrients and sediments leaving fields and pastures.**

A clear-cut riparian wetland area located between a stream and a field receiving regular applications of liquid dairy manure was identified and restored with native forest vegetation. The area was instrumented with monitoring equipment and, for a period of 8 years, scientists studied nutrient transport through the restored riparian forest.

- b. Within the first 8 years following restoration, restored riparian areas can retain large masses and high percentages of entering nutrients. More than 65% of phosphorus and 59% of nitrogen entering the restored area through surface runoff or shallow ground water was retained. **This is the first study showing that forested riparian areas can be effective in retaining phosphorus.** Restoring or maintaining forested riparian areas downslope from agricultural production sites can be an effective means of reducing nutrient discharges to receiving waters.
- c. Hatch Act
- d. State Specific

Key Theme: Water Quality

State Performance Goal: 4-2

- a. As a result of the federally mandated National Pollutant Discharge Elimination System (NPDES) Phase I and II Stormwater Rules, **all Georgians will be required to address stormwater issues more proactively.** Specifically, the rules require that large and medium size cities and counties develop and implement stormwater management plans. These plans include several components such as developing a plan of action to reduce the impacts of stormwater on water quality and developing public education programs to carry out these activities. Most city and county governments do not have technical expertise in either of these areas and the University of Georgia is well situated to provide assistance through the Cooperative Extension Service and Engineering Outreach Service.

A team of UGA scientists and extension/outreach personnel recognized the need for educating the public on effective stormwater management techniques to better meet and exceed the requirements of the NPDES Phase I and II Rules. The team initiated a comprehensive program to meet the educational and technical assistance needs of: local governments, extension agents, environmental consultants, developers, educational institutions, the military, and the general public. In 2003, UGA conducted three stormwater workshops: (1) an educational workshop attended by more than 40 county extension agents; (2) a technical BMP design workshop attended by more than 45 consultants and other professionals; and (3) a regulatory and technical workshop attended by approximately 60 Department of Defense personnel and contractors.

Additional workshops and seminars are planned for 2003 into early 2004, including: (1) a planning and design workshop for local governments and county extension agents, (2) a technical BMP design workshop for consultants, (3) an educational seminar for urban county extension agents on stormwater issues, and (4) an educational seminar to turfgrass professionals on the value of turf for erosion and sediment control. The UGA team is also providing individual technical assistance on a variety of stormwater management projects across Georgia. To ensure that the most current stormwater management methods are being conveyed, the UGA team is working cooperatively with other southeastern universities in an effort to share information and experiences.

- b. **As a result of these educational efforts, UGA has and will continue to play an essential role in providing critical stormwater information to all Georgians.** County Extension Agents have adopted much of the information supplied to them and incorporated it into their educational programs. In one case, an agent worked with their local water utility to send out 35,000 educational brochures to all the water customers in the county. Specialists from the UGA team have developed relationships with city and county governments that are working to improve water quality. For example, UGA specialists are working with Chatham County in an effort to improve the county's stormwater management strategies and to implement educational stormwater BMPs. In another project, specialists are working with Glynn County Engineering to implement innovative stormwater BMPs at new developments in the county. Consultants and other professionals have learned about new and innovative prevention and treatment technologies that are being implemented throughout the State and demand for additional courses has been high. In addition, UGA specialists have provided consultants with individual technical assistance for implementing stormwater BMPs, including a project in Athens where a UGA specialist gave design advice for a bioretention area.
- c. Smith Lever
- d. Multistate Extension: GA NC, SC, AL

Key Theme: Nutrient Management, Agricultural Waste Management

State Performance Goal: 4-6

- a. In congruence with Federal strategies, **Georgia has adopted the Nutrient Management Plan (NMP) as the method to address non-point source pollution from animal feeding operations.** Animal Feeding Operation (AFO) and National Pollution Discharge Elimination System (NPDES) regulations are administered by the Georgia Environmental Protection Division (EPD). The regulatory structure for animal feeding operations is based on the federally accepted animal unit (AU) scale. All producers above 300 AU's are required to

have a Nutrient Management Plan as part of their permit, which also carries other requirements related to their respective size. A certified planning specialist is required to write and/or review plans before they can be turned in to the state.

The EPD and Georgia Department of Agriculture (GDA), approached the Georgia Cooperative Extension Service to bring the expertise and experience of the Land-Grant University to the AFO/CAFO program in Georgia.

Extension took on the task of developing a 14-16 hour training program for county agents as well as private agricultural and environmental professionals. Experts in specific areas were recruited across the College of Agricultural and Environmental Sciences at UGA to develop presentations, chapters for a course manual and a question bank from which GDA could develop and administer a certification exam. The nutrient management specialist certification program covers the following areas: Introduction to NMP's, GA Regulations and Environmental Stewardship; Farm Maps and Critical Area Identification for NMP's; Soil, Manure and Monitoring Well Analysis; Assessment of On-Farm Nutrient Supply; Manure Storage and Treatment Systems; Nutrient Budgeting and Application; Land Application Equipment and Calibration; Monitoring and Record Keeping; Emissions from Animal Production Systems; Emergency Action Planning; Phosphorus Specific Issues; Mortality Management; Additional Environmental Management and Compliance Issues; Additional Federal and State Resources/Assistance. A comprehensive exam is administered for the entire training and is proctored and graded by GDA. The material covered in this course is very similar to that presented at the "Operator" training, however it is slightly more technical with a more rigorous exam. UGA Extension specialists have continued to work with planners past certification to provide them with continuing education in the area as well as assistance while they address client needs.

- b. **Over 150 nutrient management planning specialists have been certified to date, of whom the majority are county Extension agents.** These specialists have written and submitted more than 150 plans to the State for permitting and approval. The Georgia nutrient management planner program has been implemented with little cost to the farmer. Several studies around the Nation have concluded that nutrient management plans usually cost from several hundred dollars up to more than \$10,000 per plan. **This represents a potential savings of more than \$1,500,000 to Georgia Producers.** An additional strength of the program is the farmer and employee involvement in development of the plan. This education program enabled county agents to in turn educate and assist their producers in understanding and complying with the new AFO/CAFO regulations. This should lead to improved environmental management at the farm level.
- c. Smith Lever
- d. Multistate Extension: GA,

Key Theme: Nutrient Management, Agricultural Waste Management

State Performance Goal: 4-6

- a. Georgia currently ranks as the number one poultry producing state, producing more than 1.4 billion broilers, 13.0 million breeder hens, 12.0 million commercial layers, and 12.0 million pullets. **Poultry production in Georgia results in more than 2 million tons of poultry litter annually.** Proper utilization of this material is critical to the protection of the environment and the future of the industry.

Nutrient management plans have been developed for poultry producers in Georgia. The development and implementation of these plans have been provided through the state wide delivery of educational programs and the assistance in NMP development by county agents and state staff. Over 80 meetings reaching more than 4,000 producers have been conducted. In addition, an NMP CD and a computerized program have been developed for use by county staff and poultry growers.

- b. **As a result of the educational programs, over 70% of the growers in Georgia have developed nutrient management plans.**
- c. Smith Lever
- d. State Specific

Key Theme: Water Quality

State Performance Goal: 4-7

- a. Past research has shown that **fertilizer nutrients can be transported from golf fairways under conditions of intense rainfall and high soil moisture conditions.** Fertilizer nutrients, such as nitrate nitrogen and phosphorus, when introduced into surface waters, can degrade water quality. Research on amounts of water and nutrients that runoff of turfgrass under many different soil and climatic conditions is time consuming and expensive.

The Root Zone Water Quality Model (RZWQM) was applied to data gathered from runoff plots at the Griffin Campus of the University of Georgia. Some data was used to calibrate the model and other data to help validate the model. This model is a comprehensive model, and once calibrated, it can be used to predict runoff of nutrients from turfgrass areas under varying conditions of rainfall, soil, turfgrass type, climatic conditions, etc.

- b. The RZWQM model accurately predicted the volume of runoff water from research plots using several years of data. However, the amounts of nitrate nitrogen transported were over predicted in general by the model near the end of the summer season for several years. The model has promise as a tool for predicting runoff of nutrients from turfgrass, but will need some refinements. **The RZWQM model will be an important method by which regulators and other agencies can use existing research information on transport by runoff water that was produced at specific locations and extend the information to other locations and circumstances.**
- c. Hatch Act
- d. State Specific

Key Theme: Water Quality

State Performance Goal: 4-7

- a. Most farmers were surprised by the argument that their irrigation water withdrawals from wells were being included in the Tri-State Compact negotiations. The Compacts were supposed to cover only surface water withdrawals. But an investigation of groundwater withdrawals at the Marine Corps base south of Albany showed that drawdown reduced groundwater flow to blue holes and seeps feeding the Flint River. A 1 gallon withdrawal could lower flow to the river by 0.6 gallons. **While many scientists and local well drillers were convinced that the drawdown impact on the Flint River could not be as high as projected, there was far too little data to support or refute the studies.**

College scientists and extension specialists teamed up with US Geological Survey and Georgia Environmental Protection Division scientists and hydrologists to set the record straight. USGS agreed to develop a special model of groundwater and surface water interaction if EPD would provide new data on aquifer flow properties and UGA would measure daily water use by irrigators. In the Dougherty Plain, UGA, EPD and farmers cooperated to identify the location of all 4,360 wells used for irrigation. A random sampling of 4% of those wells was made and the farmers who used them asked to voluntarily participate in real-time monitoring. **Each time their irrigation was started or stopped, a cell phone and internet communication was made within a few minutes and the observation was logged on computers in Tifton.** UGA also assisted EPD in measuring flow rates during aquifer pump tests in the farm areas of this Southwest Georgia region.

- b. Farmers in the study used their irrigation systems about 11% of days each year. They used about 6% of their actual pumping capacity of 15.8 million gallons per

day. Since spring of 2001, the real-time observations have kept track of irrigation at 177 center pivots, 4 solid-set orchards, and 11 drip irrigation systems that supplied water to almost 25,000 acres. On these fields farmers produced row crops, grain, pasture, vegetables, sod and pecans. **With the wide diversity of irrigation systems and crops included in the study, the metering system has provided USGS and EPD collaborators a realistic evaluation of daily water withdrawals made from wells in the Dougherty Plain.** It will become the primary data for their models to predict withdrawal impacts on Flint River flow. The commercial tracking equipment and cell phone communication worked 92% of the time, despite the harsh field operating environment. **The experiences gained with this full-scale real-time metering system has provided a foundation for real-time monitoring that Georgia farmers will need to assure Federal and State regulators that they are doing their best to conserve water.** It can also serve as an early warning system for droughts that affect farmers.

- c. Smith Lever
- d. State Specific

Key Theme: Water Quality

State Performance Goal: 4-9

- a. Seashore Paspalum is a native coastal grass with tolerance to many of the environmental stresses commonly associated with coastal environments. Most importantly, this relatively unknown species tolerates soils with high salt concentration. The University of Georgia recently released two cultivars of seashore paspalum for use on golf courses in coastal environments. **Because of their tolerance to salt, these cultivars will grow where other grasses won't.** Seashore paspalum must be reproduced vegetatively using sod or sprigs because this plant produces very few seed and the seed that it does produce do not germinate due to an inherent dormancy. This species holds great promise for reclamation use on salt-affected sites but the cost of establishing it vegetatively is too expensive for most environmental reclamation projects. Seeded types of seashore paspalum are needed to reduce the cost of establishment.
- b. University scientists collaborating with a private seed company in Oregon have now overcome inherent problems with self-incompatibility by inter-planting two different ecotypes of paspalum that can pollinate each other. **The result is the world's first seeded seashore paspalum cultivar, 'Seaspray'.** Unfortunately, seed dormancy remains a great problem in this new seeded cultivar. Although the seed produced are viable, the rate of germination can be as low as 1%. UGA scientists are now working to learn how to reliably overcome the dormancy so that the seed will germinate. Recent breakthroughs in the research laboratory provide great hope that seeded seashore paspalum cultivars may soon be available

for a host of uses including erosion control along salt water estuaries, reclamation of dredged sites, stabilization of coastal soils, plant cover for effluent application fields, and recreational uses on salt-affected sites.

The development of seeded cultivars of seashore paspalum will provide an environmentally sound solution to many issues associated with urbanization of coastal areas. In the near future, seashore paspalum will be used to restore and maintain our fragile coastal environments by providing protection of water, soil, and other valuable natural resources.

- c. Hatch Act
- d. State Specific

Key Theme: Agricultural Waste Management

State Performance Goal: 4-9

- a: The continued exponential growth in human population has created a corresponding increase in generation of biosolids, end product of wastewater treatment plants. **The annual production of biosolids in the United States is projected to increase sharply to 47 million tons within the next decade.** Land application is becoming a major means for biosolids disposal because of its beneficial effects on agricultural productivity of soils. However, due to its close association with human activities, biosolids often serve as a sink for anthropogenic organic chemicals that cannot be degraded during the wastewater treatment processes. EPA currently has no regulations on the levels of organic chemicals in biosolids although land application and landfill of biosolids could have a high potential of continuously introducing organic contaminants into the water resource due to surface runoff and leaching. **Wastewater treatment plants in the United States and world-wide are in urgent need for scientific sound information on the environmental fate of anthropogenic organic chemicals in wastewater and biosolids.**

In collaboration with a forest soil scientist at UGA and the personnel at a wastewater treatment plant in the area around Atlanta, selected anthropogenic organic chemicals were identified in the wastewater that is used to irrigate a forest land and in the biosolids-applied land. Faculty are currently investigating the potential for these compounds to migrate to the groundwater in that area.

- b. A variety of anthropogenic organic chemicals were detected in biosolids from Georgia wastewater treatment plants. The levels of the detected anthropogenic organic chemicals in the biosolids ranged from parts per billion to parts per million. Nonylphenol, an endocrine disruptor, was detected up to 1000 parts per million in several biosolids from wastewater treatment plants servicing cities with

heavy industry. The knowledge gained from the current project investigating the movement of biosolids- and wastewater-associated anthropogenic organic chemicals will be shared with waste water treatment plant managers, decision makers, and the general public by web communication, reports, presentations, and workshops. **The success of this research will not only have significant economic impact on wastewater treatment plants in the United States and world-wide but also have tremendous environmental impact.**

- c. Hatch Act
- d. State Specific

Key Theme: Natural Resources Management, Wildlife Management

State Performance Goal: 4-2

- a. The **4-H Environmental Education Program** operating at Rock Eagle, Jekyll, Tybee and Wahsega 4-H centers provides relevant learning experiences for children from pre-kindergarten through 12th grade by providing academic field study experiences designed to make learning fun. Math, science, language, art, history, social studies and other subjects are taught by on-site staff at the four 4-H centers. They focus on hands-on, experiential, real world learning that makes learning relevant to the students. A visit to the Natural History Museum at Rock Eagle incorporates learning themes on natural history, forestry and agriculture.
- b. The statewide 4-H Environmental Education Program makes education come alive for thousands of children. Students who participate in the Environmental Education Program statewide have been tested through pre- and post-tests conducted at each one of the centers. **The data collected indicates content knowledge gains between 40 percent and 45 percent as a result of their field study trips to one of the centers.**
- c. Smith Lever
- d. State Specific

GOAL FIVE ENHANCED ECONOMIC OPPORTUNITIES AND QUALITY OF LIFE FOR AMERICANS

Many internal and external problems impact the quality of life of Georgia citizens. Efforts to improve quality of life are a high priority of our faculty. The Georgia 4-H Program has continued to demonstrate large impact on the youth of Georgia. The development of leadership skills continues to serve as a cornerstone of the 4-H educational program.

Family resource management goals are increasing more important. Georgia ranks third highest in bankruptcy cases in the nation. Consumer education is needed to help limited resource and low-income families make wise choices in the marketplace.

Georgia's senior adult population will nearly triple by the year 2025. This segment of the population is seeking to remain independent as long as possible. Extension faculty provide educational programs which allow seniors to meet their changing life needs in life skill areas like housing, financial management, health and nutrition.

Several new community projects were initiated this year including one very successful model that directly addressed the development of healthy, strong, and self-sufficient families within the migrant farm population of rural Georgia. Another new program targeted low income pre-adolescent males. These models are helping to develop workable programs that address important issues.

Georgia Extension continues to be the one largest single source of required community-based education for Georgia child care providers. Child care that is affordable, accessible, and of high quality is not available to many Georgia parents needing it. Extension provided nearly 279,000 educational contact hours to nearly 30,000 child care providers, parents, and others last year.

From parenting education to avoiding telemarketing fraud, Extension faculty continue to have great impact on the daily lives of Georgia citizens.

Key Theme: Family Resource Management

State Performance Goal: 5-1

- a. During the 12-month period ending December 31, 2002, 1 of every 45.7 households filed for bankruptcy in Georgia. According to the American Bankruptcy Institute, Georgia ranks the third highest in bankruptcy cases in the nation. According to the 2003 County Guide, there were 75,713 bankruptcy filings in Georgia during this period. **Georgia ranks the third highest in bankruptcy cases in the nation** (American Bankruptcy Institute). The personal saving-rate for the United States is at the lowest level in history, suggesting that

Georgians and other citizens are not saving adequately for future needs. Families need to know how to plan their finances, cope with lack of adequate income effectively, control cash flow, manage credit and debt wisely, insure adequate, contribute to savings/investments regularly, pay necessary taxes but no more, prepare to retire at current living level, and pass assets to heirs. Limited resource families, particularly, are faced with economic uncertainty, and it is often difficult for these families and individuals to make wise consumer choices in the marketplace and meet basic needs.

More than 11,500 Georgians received in excess of 21,600 hours of education designed to increase financial literacy. More than half were low-income clients. Nearly 400 low-income Georgians in selected counties received free assistance to file federal and state income tax returns. Personal Financial Choices workshops for Chapter 13 bankruptcy filers were conducted for a nine-month period in six North Georgia Counties for more than 700 individuals. Extension faculty partnered with the Georgia Consortium for Personal Financial Literacy to assemble a statewide coalition to launch a statewide campaign to promote the savings habit called Georgia Saves. Nine workshops were conducted across the state to train 150 volunteer wealth coaches. Each wealth coach supports and encourages at least 5 Georgia Savers. Media were a major strategy for public financial management education: articles in newsletters reached more than 547,500 people; radio spots were broadcast to a listening audience of more than 1.4 million; newspaper columns went to a circulation of almost 1.3 million; and television programs were broadcast to more than 1.8 million viewers.

- b. **Free assistance provided by Consumer Financial Literacy Program (CFLP) staff in 10 rural counties helped 400 low-income families to save more than \$30,100 in tax preparation fees paid in the previous year.** Most (61%) took advantage of Direct Deposit to receive their refunds and avoided costly refund anticipation loans. More than 60% were able to claim the Earned Income Tax Credit resulting in a total value of more than \$600,000 in tax refunds. Most (84%) participants in Extension Debt Reduction programs said the program helped them to learn how to get out of debt. For example, one participant wrote, "I learned to watch how I spend my money, to stop buying things I really don't need but want." **A follow-up survey of participants in the Personal Financial Choices workshops for individuals in Chapter 13 bankruptcy showed that 78% participants said their finances improved as a result of something they learned at the workshops.** For example, 33% developed a written plan for spending; 47% talked with their family about expenses; 52% reduced spending for one or more expenses; 52% of respondents organized their financial records; 54% tracked their spending; and 54% paid their bills on time. A participant mentioned "I wish I had the class two years ago...I probably wouldn't have filed for bankruptcy." A follow up survey of individuals participating in the Making Every Dollar Count train-the-trainer programs showed that participants improved their financial management behaviors. More than 70% of the participants developed a written plan for spending and 86% balanced their checkbook every

month. More than 50% of the participants said the workshop improved their ability to understand clients' information needs.

More than 70% of the University of Georgia students who participated in the Peer Financial Counseling Program said that it helped them to learn financial management practices. Most of the students who participated in the program planned to improve their personal financial management practices. For example, 82% planned to consider the cost of using credit cards; 89% planned to review their credit reports and correct any errors; 67% planned to keep track of their income and expenses; and 63% planned to find ways to decrease expenses.

More than 84% of the community volunteers in the Georgia Saves program said the training prepared them to be wealth coaches in their communities. More than 50% of the participants developed a positive attitude toward saving. More than 60% said that they would conduct motivational workshops in the community and 90% said they planned to motivate at least five individuals to become savers. More than 95% of the participants in the Dekalb First Account Extension program said they learned how to open and manage a bank account. All participants in the Telemarketing Fraud Prevention Extension Program said that they would be very cautious when conducting business over the telephone with unsolicited callers.

- c. Smith Lever
- d. State Specific

Key Theme: Jobs/Employment

State Performance Goal: 5-2

- a. **Self-management skills are the foundation of employee marketability.** They begin with setting personal goals which include the enhancement of one's appearance and health. Appropriate work apparel, grooming and hygiene, proper diet and exercise practices all contribute. While initial goals are being determined and achieved, progress can be made toward developing skills needed to competitively interview for and hold a job. **In Georgia, more than one million persons live below the level of poverty.** According to Georgia DHR, 130,409 persons received TANF every month in 2002. Georgia ranked 23rd in the U.S. in per capita income for 1999 at \$27,324 and has a higher poverty rate for both individuals (14.7%) and children (22.8%) than the U.S. overall (Source: U.S. Census).

More than 4000 Georgians received nearly 10,000 hours of work force preparedness education. Nearly half (46%) were low-income or at-risk audiences. The Surviving Tough Times extension program, targeted to individuals

experiencing a reduction in hours or lay-off, provided important information about surviving on less resources for more than 300 unemployed workers. Fourteen Welcome to the State of Poverty simulation workshops were conducted for nearly 500 community leaders and service providers. This simulated "month" in poverty informs participants of the realities faced by working poor families. Provided work force preparedness and consumer education by media to thousands of Georgians: related articles in newsletters reached over 2,150 people; radio spots were broadcast to a listening audience of over one million people; newspaper columns went to a circulation of almost 994,000 and television programs were targeted to almost 145,000 people.

- b. **A majority (89%) of the people who participated in the Surviving Tough Times extension program said the program helped them to gain knowledge and skills to manage a period of unemployment.** Most of the participants learned to make correct consumer decisions. For example, 66% of the participants planned to contact their creditors to explain their job situation; 56% planned to reduce household utilities to lower their bills; and 59% planned to identify at least one way to reduce their spending. **More than 90% of the community leaders and service providers who participated in the Welcome to the State of Poverty simulation workshop said it helped them to better understand and relate to the issues and problems faced by working poor families.** More than 55% of the participants in the poverty simulation workshop developed a more positive attitude toward people living in poverty; 96% planned to view people living in poverty differently to better serve their needs; 90% planned to work with other related community resources to assist people who live in poverty and seek out information that can be used to address poverty issues in their community.
- c. Smith Lever
- d. State Specific

Key Theme: Children, Youth and Families at Risk

State Performance Goal: 5-2

- a. Clothing assumes an important role in contributing to the well-being of all individual, young and old, male and female. Clothing is a basic necessity throughout the life cycle. **Consumer education is needed to help limited resource and low-income families make wise choices in the marketplace.**

PART A: (1) Consumer clothing and textiles programs were designed to help limited resource families improve their decision making skills when making clothing/textiles purchases. (2) A clothing and textiles training was designed for county agents and program assistants to provide up-to-date information on recent trends and issues in the clothing/textiles and related areas. (3) Personal

development programs were designed to focus on enhancing the physical well-being, grooming, social skills and other factors involved in personal appearance. PART B: Clothing safety programs were designed to protect limited resource families from unreasonable risk of injury from unsafe clothing and to increase awareness of clothing safety in regards to personal protective clothing for individuals, families and farmers.

PART A: (1) Consumer clothing programs consisted of county-based programs on back-to-school shopping, sharpening your clothing skills and caring for and repairing clothing. **These county-based programs focused on clothing selection, reading labels, clothing care/storage.** A made at home show was held to help limited resource families generate extra income for increasing the family clothing budget. (2) Seven program assistants participated in the clothing and textiles training and received new resource packets to use for their county-based trainings. (3) Dress for Success programs for limited resource individuals were designed to enhance their employability skills. Other programs focused on enhancing personal development skills for children and youth. These programs were presented at head start agencies, schools, senior centers, summer day camps, parenting programs, Department of Family and Children Services, colleges and universities. The program has reached more than 1,000 limited resource individuals and families. The following publications were distributed to over 5,000 limited resource individuals and families: (1) Ten Steps to a Clean Wash, (2) The Clothes Line Newsletters, (3) Fiber Facts, (4) A Circus of Good Habits Coloring and Activity Booklet (5) Dress for Success Booklet. PART B: The clothing safety program consisted of county-based programs on clothing safety. Clothing Safety for Halloween booklets were distributed to over 5,000 individuals in schools, parent groups, head start, daycares, fairs, consumer programs, etc. Clothing Safety: Handling Pesticide-Contaminated Clothing exhibit and flyers were distributed at the annual Agricultural Sunbelt Expo Farm Show. More than 2,000 safety handouts were distributed.

- b. PART A: (1) Overall evaluation of the value of the program by participants was excellent. **Nearly 80% of those surveyed after the programs indicated they plan to adopt one or more recommended practices to improve their skills and to change their spending behavior.** (2) All participants reported they gained new knowledge after attending the clothing and textiles in-service training. PART B: Participants receiving the clothing safety information expressed an increase in awareness to protect families from unreasonable risk or injury from unsafe clothing and personal protective equipment.
- c. Smith Lever
- d. State Specific

Key Theme: Children, Youth, and Families at Risk

State Performance Goal: 5-2

- a. There are internal and external social problems impacting families, individuals and communities. **Some of these problems are centered around ineffective parenting, communication skills and family life.** Parents need to learn how to openly and effectively communicate and share values, attitudes, and knowledge with their children. Society increasingly recognizes the critical importance of effective parenting and communication. Unemployment, mobility, divorce, and absent parents, along with related social conditions, combine to aggravate parent-child relations. Adults play critical roles in the physical, emotional and mental development of children. Increasing numbers of youth are growing up without the basic types of support necessary to become capable and responsible adults. This support takes many different forms, including nurturing parenting, positive school experiences, supportive communities and opportunities to explore career and life options. Extension provides a unique approach to supporting youth and families-at-risk through an overall positive youth development focus.

A Family Development/Life Program to address teen pregnancy prevention (youth taking charge), parent education and basic skills was implemented.

Major components of the program are curriculums and resources that were adopted from and supplied by both 1862 and 1890 institutions with similar outreach programs, such as the University of Arkansas at Pine Bluff, Washington State University and Oregon State University. Additional support curriculums and educational resources were purchased. To expand the Family and Consumer Sciences unit of the Fort Valley State University Cooperative Extension Program, in 2003 specialists in the areas of housing, family life, resource management, and 4-H and youth development were hired in 100% Extension positions. The specialist in the area of clothing and textiles remains in the 25% Extension and 75% Teaching position.

Through the Family Development/Life Program: Two (2) trainings for Extension county-based employees were implemented and one (1) multi-state educational workshop was co-sponsored. One (1) county agent and seven (7) program assistants reported on their Youth Taking Charge, Parent Education, Parenting and Basic Skills Programs. An estimation for the Youth Taking Charge Program resulted in 174 children reached, 125 parents reached, 33 volunteers reached, 56 meetings/activities conducted, and 1251 publications distributed. An estimation for the Parent Education/Parenting Program resulted in 307 parents reached, 44 volunteers reached, 88 meetings/activities conducted, and 1767 publications distributed. An estimation for the Basic Skills Program resulted in 271 families reached, 865 adults/individuals reached, 51 volunteers reached, 73 meetings/activities conducted, and 2,210 publications distributed.

- b. **Campus and county-based employees reached a reported 923 clients.** Programs were implemented in schools, churches, homes and other sites with the

focus on family development/life, getting families involved, parenting skills and youth taking charge (teenage pregnancy prevention). One (1) county agent and seven (7) program assistants reported that they reached clients through the Youth Taking Charge Program (23% or 214), Parent Education/Parenting Program (35% or 320), and Basic Skills Program (42% or 389). Through the Youth Taking Charge Program 55% or 117 children abstained from early sexual activity and 45% or 97 children have a better relationship with their caregivers. Through the Parent Education/Parenting Program 51% or 162 parents have improved their parenting skills and 49% or 158 parents are keeping up with their children in school. Through the Basic Skills Program 51% or 197 clients adopted one or more recommended practice and 49% or 192 have changed behavior and increased knowledge. In addition, county-based employees are regularly working with 111 Youth Taking Charge clients, 296 Parent Education/Parenting clients and 367 Basic Skills clients. By working with these clients, a total of 32 current family development/life issues and concerns have been identified in counties that will be addressed.

The housing specialist (100% Extension) was hired in March 2003. From March 2003 through December 2003, the specialist provided outreach to over 135 limited resource families. The specialist assisted 26 limited resource clients with understanding how to become a home owner, provided technical assistance to 24 individuals, provided home safety education to 44 limited resource youth between the ages of 6 and 10, and distributed 2,600 publications and flyers. The family life specialist (100% Extension) was hired in May 2003. From May 2003 through December 2003, the specialist introduced programs to over 400 Georgians and built partnerships with 7 groups and organizations.

The resource management specialist (100% Extension) was hired in March 2003. From March 2003 through December 2003, the specialist built partnerships with over 30 religious and educational institutions, community groups and organizations, and governmental agencies. Over 900 targeted clients were reached. The 4-H and youth development specialist (100% Extension) was hired in April 2003. From April 2003 through December 2003, the specialist implemented and organized youth camps and clubs. The specialist reached 18 volunteers and 2,589 youth through community organizations and public school systems.

- c. Smith Lever
- d. State Specific

Key Theme: Aging

State Performance Goal: 5-3

- a. **Georgia's senior adult population will nearly triple by the year 2025**, with the largest rate of increase among those over 85 years of age (US Census population projections). Many seniors will remain healthy and vital to much older ages resulting in opportunities for volunteering, nontraditional jobs and recreation; there will also be increased demand for specialized services in housing, education, health and nutrition. Seniors are seeking to remain independent as long as possible and frequently choose personal care homes for assisted living as it becomes necessary.

UGA faculty provided educational programs which allow seniors to meet their changing life needs in life skill areas like housing, financial management, health and nutrition. Faculty offered seniors opportunities for community involvement as volunteers.

- b. **Family and consumer science extension programs reached 20,030 senior citizens in 2003.** Of the seniors who participated in family and consumer extension programs, 83% were in nutrition and food safety educational programs; 4% were in financial management and consumer education programs; and nearly 3% were in diabetes and chronic disease prevention programs. Nutrition, food safety, and diabetes education programs reached nearly 300 personal care home providers. Family and Consumer Science extension developed and delivered the Seniors Taking Charge nutrition and health education program to help senior citizens improve their health.

Almost 89% of the seniors who participated in Foods and Nutrition education programs said those programs were helpful to learn healthy nutrition concepts and practices. After participating in the program, the majority of them said that they plan to adopt healthy dietary and nutrition practices. For example, 93% said that they plan to try calcium fortified food or drink; 59% said that they plan to consume fat free or reduced fat milk; 62% said that they plan to use foods from the fats, oils, and sweets group sparingly to reduce fat intake; 66% said that they plan to read nutrition labels in order to select healthy products; and 69% said that they plan to use the food guide pyramid for making food choices. Over 83% of the seniors who participated in food safety education programs said those programs were helpful to learn safe food handling and sanitary practices. The majority of the seniors who participated in the program said that they plan to apply safe food handling practices. For example, 85% said that they plan to keep raw meats separate from other foods to prevent bacteria spreading from one food to another and all of them said that they plan to rinse vegetables well with running cool water before they are eaten.

Nearly 58% of the seniors who participated in the Telemarketing Fraud Prevention Extension Program improved their knowledge with regard to potential telemarketing fraud and prevention strategies. Those who participated in the Diabetes Education program learned to apply recommended practices for controlling their diabetes. For example, 90% said that they plan to

follow a meal plan to control their proteins and intake of carbohydrate; 96% said that they plan to use artificial sweeteners to control their sugar and calorie intake; 69% said that they plan to modify their own recipes to cut sugar, fat or sodium; and 55% said that they plan to identify the signs of low and high blood glucose levels. Follow up clinical and medical data showed that the seniors who participated in the Walk-A-Weigh nutrition and exercise program significantly reduced their body weight.

Key Theme: Child Care/Dependent Care

State Performance Goal: 5-4

- a. Child care is the third highest household expense for most families of young children (after shelter and food). According to DHR, the cost of care ranges from \$68 to more than \$100 per week per child. **Child care that is affordable, accessible, and of high quality is not available to many Georgia parents needing it.** Most child care in Georgia and nationwide is only of marginal or poor quality. High staff turnover, poor quality environments, and lack of training and experience in child care staff contribute to low quality care. According to the Center for the Child Care Workforce, the average hourly wage of a Family child care provider, a Child care worker, and a pre school teacher is respectively \$4.82, \$7.42, and \$9.43. Many parents seek the least expensive source of care, not understanding the benefits of high-quality early care and education.

Extension contributed to improve the quality of child care by: organizing and presenting local and regional training workshops and conferences for child care professionals; providing self-study courses for caregivers who cannot attend in-class training sessions; providing print information on child development for child care professionals; providing consumer information to help parents identify quality child care; and consulting with employers and community leaders to ensure the availability of consistent, high quality child care as a vital part of community infrastructure.

- b. **Extension is one of the largest single sources of the required community-based education for Georgia child care providers. Extension provided nearly 279,000 educational contact hours to nearly 29,460 child care providers, parents, and others in 2003.** Extension provides this training at approximately 1/4th the cost of utilizing consultants and other agencies. Conducted six Early Childhood Institutes (ECI) to help child care providers improve their knowledge and skills in Georgia in 2003. The Child Care Self-Study Program was delivered to 80 child care providers. Extension collaborates with numerous other organizations, including child care resources and referral agencies, technical agencies, and the Advancing Careers through Education and Training initiative to ensure that high-quality community-based training is available for child care providers. Extension is a partner in grant projects to support professional

development for child care providers. Media efforts have been undertaken to increase awareness and child care knowledge: Newsletter articles have reached more than 103,100 clients; radio spots have been broadcast to a listening audience of nearly 1.6 million; newspaper columns have gone to a circulation of almost 2 million; and television has targeted 147,000 viewers.

Almost 95% of the child care providers who participated in the Early Childhood Institute (ECI) said the program was helpful to improve their child care knowledge and skills. Nearly 89% of the participants said that the ECI met their child care learning needs. The child care providers who participated in the Dare to be Messy training program indicated that they intend to apply learned activities in their child care setting. For example, 76% of the participants indicated that they plan to try out some of the sensory recipes they made in the class. Overall, the majority of the participants in child care extension programs planned to adopt learned practices and to improve the quality of child care. For example, 97% planned to expose children to a variety of sensory materials and to display children's art at their eye level; 87% planned to use consequences to guide children's behavior; 74% planned to give children choices of activities; and 91% planned to include free art opportunities and materials in the classroom regularly.

Most of the child care providers who participated in the Teaching Basic Health and Safety extension program learned to teach basic safety concepts. For instance, 85% said they plan to provide children with opportunities to recognize and respond to emergencies appropriate for their age; 91% said they plan to help children overcome their fear of emergency situations by teaching them about community rescue workers and their equipment; 93% said they plan to give children examples of ways they can prevent injuries when they are at home; and 68% said they plan to help children become familiar with sights and smells they may experience at the doctor's office.

- c. Smith Lever
- d. State Specific

Key Theme: Impact of Change on Rural Communities, Youth Development/4-H

State Performance Goal: 5-5

- a. **Youth need opportunities to provide service and increase their understanding of issues relative to individuals who are at risk.** Youth need projects that enable them to take a personal part in improving the quality of life for their peers who have limited resources or extraordinary challenges. Service learning is an integral part of youth development.

A statewide youth summit was conducted to address issues at the state and local level. The Summit included youth and adult teams in educational pursuits and development of service projects.

Junior-Senior project achievement includes a component for inclusion of service activities in project work and other activities. These activities are reported in the portfolio as 50% of the final records score (with leadership).

Junior Conference focus on not only on workforce preparation skills but also on service to others with the opportunity to complete several service projects for statewide projects. Local 4-H programs include service programs coordinated by 4-H'ers as a part of the 4-H motto of making the best better for the community

- b. 702 youth and adults representing 137 counties participated in the youth summit. More than 2500 7th-12th grade students completed portfolios including service records. More than 800 youth participated in Junior Conference raising more than \$1500 for the Ronald McDonald House.

Written and discussed action plans for community service have been developed for 147 counties. State issues have been identified and described to state level decision makers around the topics of education, economic development, the environment, and safety. **Local grants have been awarded to 8 communities to help put their plan into action. Families of terminally ill children received \$1500 from 4-H'ers.**

Key Theme: Youth Development/4-H

State Performance Goal: 5-6

- a. **Performing arts is an area that youth have a high level of interest in very large numbers.** Often youth do not have ample opportunities to present their talent and develop presentation skills. Research validates that often younger students have very limited opportunities to showcase their talent. Performing arts experiences enhance self esteem and improve communication skills.

4-H as a part of the CAES Cooperative Extension Service provided performing arts opportunities for youth at local, district, state and national forums. These opportunities include four different performance areas and 18 different locations for three age groups. 4-H also held auditions and cast a statewide performing arts group to represent 4-H and develop life skills in addition to the statewide program, talent presentations and performances are part of an area of regional fairs and talent shows.

Awards and recognition resources were provided by private funds amounting to more than \$6000. Volunteers contributed 1500 hours to the project.

- b. **812 youth participated** in district competition in performing arts projects. 110 youth participated in auditions for the statewide performing arts group, Clovers & Company. 4-H members presented talent at eight other forums. Approximately 130 youth used 4-H performing arts as their base for presentations.

Participation data validates that the Arts are the largest areas of participation by high school students in 4-H. The inclusion of these areas serves as a motive for many high school student to stay involved in 4-H. The impact of the programs can best be explained by coupling the life skills learned in the area and adding the reality that these youth are in 4-H because they find a way to showcase and develop their interest. Four recording artist and many educators attribute their success in the music industry to their involvement in 4-H arts program.

- c. Smith Lever
- d. State Specific

Key Theme: Youth Development/4-H

State Performance Goal: 5-7

- a. **Youth in today's environment need opportunities to develop life skills** which address responsibility, teamwork and goal-oriented achievement. With an increasingly urban population a need exists to provide opportunities for young people to **learn about animal products, methods of animal production, economics of animal production and environmental issues related to animal agriculture.**

In 2003, The University of Georgia Cooperative Extension Service hosted the Southern Regional 4-H Horse Championships, July 30 through August 3, in Perry at the Georgia National Fairgrounds and Agricenter.

The UGA Animal and Dairy Science Department staff and 4-H staff, in cooperation with State Department of Education Agricultural Education staff, offer livestock show projects to 4-H and FFA members in Georgia. Young people raise and care for cattle, sheep or swine. After the animals are trained, youth compete in shows and use these experiences as the basis for other competitions including record keeping, public speaking and Quiz Bowl events.

- b. In 2003 there were 4,184 animals entered in livestock projects with 2,380 youth participating.

More than 1,200 entries represented 13 states of the Southern Regional 4-H Horse Championships in the educational events like Horse Quiz Bowl and team demonstrations, and the Horse Show with six divisions of competition. **It was one of the single largest equine youth events in the nation.** The educational contests help to make the youth more knowledgeable and teaches a sense of sportsmanship and fair play. At the same time parents, coaches, and trainers become more knowledgeable and make them become better horse people as well as help them in working and training future youth.

- c. Smith Lever:
- d. State Specific

Key Theme: Youth Development/4-H

State Performance Goal: 5-6

- a. The passing of House Bill 605 by the **Georgia Legislature mandated the teaching of character education in Georgia schools. The Georgia 4-H youth development program has adopted the character education curriculum across the state.** For example, in DeKalb County's 4-H program, each monthly lesson plan corresponds with the character trait assigned by the DeKalb County School System. The curriculum consists of lesson plans for each club meeting that include the six pillars of character, each with a definition, recreational activities, community service ideas, role play activity and a character-building challenge.
- b. More than 1,800 4-H'ers participated in this county program. Teachers, 4-H leaders and parents have noticed an improvement in the behavior in 96 percent of their children. Similar programs were conducted in counties throughout the state.
- c. Smith Lever
- d. State Specific

Key Theme: Children, Youth, and Families at Risk, Leadership Training and Development

State Performance Goal: 5-7

- a. **Increasing numbers of youth are growing up without the basic types of support necessary to become capable and responsible adults.** This support takes many different forms, including nurturing parenting, positive school

experiences, supportive communities and opportunities to explore career and life options. Extension provides a unique approach to supporting youth and families at-risk through an overall positive youth development focus, in addition to targeting specific at-risk groups and behaviors. Many Georgia children are living in at-risk environments. Nationally, Georgia ranks 41st in overall child well-being, based on 10 indicators tracked by Kids Count. Indicators include teen deaths, births to teen parents, juvenile violent crime, and percent of children in poverty. Georgia ranks 44th for rate of teen child baring (Georgia Kids Count fact book 2003).

UGA faculty conduct educational programs for parents, helping them to acquire skills in positive parenting. The faculty used the 4-H youth development delivery system to provide positive development opportunities for youth in high-risk circumstances. They collaborated within the community to design programs which target children, youth or families at-risk and provide education, support and services which lead to positive outcomes.

- b. **The University of Georgia Cooperative Extension Service initiated two New Community Projects in Candler and Colquitt Counties in 2003.** These New Community Projects integrate the children, youth, and families at risk (CYFAR) programming philosophy and ideas into the University of Georgia Extension programs. · The Candler County CYFAR project is "Building Our Youths Skills" (BOYS) and it **provides educational and enrichment opportunities to help increase academic success and leadership development**, while supporting parents, teachers, and community leaders in creating a safe, healthy, and nurturing environment for 31 low income pre-adolescent males. The BOYS program provided 33 after-school tutoring and enrichment sessions in fall 2003. · The Colquitt County CYFAR project is called "Voz de la Familia" or "Voice of the Family." This project is a comprehensive family centered community outreach program especially designed to **help migrant farm workers build healthy, strong, and self-sufficient families for rural Georgia.** The project started with eleven migrant farm worker families in 2003. · The Rowel Welcome to the State of Poverty Simulation workshop was conducted to over 470 community leaders and service providers to help them better serve the needs of the people who live in poverty. · More than 63% of all Family and Consumer Sciences Extension programs in 2003 were conducted with audiences estimated to be at risk (low-income, illegal activity, or lack of school success).

Over 55% of the community leaders and service providers who participated in the Welcome to the State of Poverty Simulation workshop realized the problems and constraints faced by the people living in poverty and developed positive attitudes towards them. For example a participant said that "this workshop was a real eye opener, the simulation provided very real circumstances so we could experience the abundant difficulties persons in poverty situations are faced with. It was frightening." At the end of the workshop, 95% of the participants said that they intend to view people living in poverty differently to better serve their needs and

89% of the participants said that they plan to work with other related community resources to assist people who live in poverty.

- c. Smith Lever
- d. State Specific

Key Theme: Leadership Training and Development, Youth Development/4-H

State Performance Goal: 5-8

- a. **Development of leadership skills continues to serve as a cornerstone of the 4-H educational program.** Through the mission of assisting youth in acquiring knowledge, developing life skills and forming attitudes, 4-H program activities strive to not only tea

Programs planned on the county, district, and state level have provided youth with skills necessary for developing leadership skills. Georgia Officers Training offers in-depth training for district and state officers at the junior and senior level. At the county level, leadership is a cornerstone of 4-H involvement. Youth are involved in planning and implementing programs, in project club leadership, as committee chairs and as officers. Leadership programs are provided in the camp counselor training programs for both high school and collegiate members.

- b. 40% of the Georgia General Assembly stated they had been involved in 4-H. **4-H was named as the lead agency in the state to facilitate and deliver youth leadership opportunities to students.**
- c. Smith Lever
- d. State Specific

Key Theme: Value Added Agriculture:

State Performance Goal: 5-9

- a. The latest **EPA-mandated low sulfur diesel fuels** for highway vehicles are reported to cause accelerated wear in diesel engines due to reduced lubricating properties of the new diesel fuels. Addition of a small amount of biodiesel fuel is one very promising approach to improving the "lubricity" quality of the new low emission diesel fuels. It is not yet clear which of the several types of biodiesel will be the best lubricity additive. One of the most promising biodiesels is derived from castor oil. However, extensive research was needed to confirm the value of castor-based biodiesel, particularly the new castor cultivars now under

development by USDA. There is also a need for diverse new crops with large market demand to sustain income in production agriculture. With oil imports currently near record levels, viable U.S.-produced products which do not depend on oil imports are consistent with national concerns over balance of payments and national energy security. Development of a major new market for production agriculture is strongly supportive of the goals of the USDA.

As part of an ongoing research effort on biodiesel fuels at UGA, methyl ricinoleate (biodiesel from the castor plant) has been tested as a potential lubricity additive for petroleum diesel. The unique chemical properties of processed castor oils make it an ideal candidate as a fuel additive; its hydroxyl molecular structure is unique among plant oils and it burns cleanly along with petroleum diesel in truck and tractor engines. The tests that were conducted with this green biodiesel additive include long term storage stability, ASTM lubricity, and ASTM Cloud Point. These tests all consistently supported the use of this biodiesel additive for diesel 2D. The short term result of this work would be a large market for the oil from castor seed. The longer term potential would lie in plant breeding to transfer the unique molecules in castor seed oil to other agronomic plants, including soybean and peanuts, for example. The potential economic impact would be measured by sales of new types of farm-produced seed oil commodities. Also, income due to jobs created in the oilseed processing industry would be a measurable economic impact.

- b. The potential economic impact would be measured by sales of new types of farm-produced seed oil commodities. Also, income due to jobs created in the oilseed processing industry would be a measurable economic impact. During 2003, extensive tests listed above have reinforced the promise of castor seed oil as a candidate additive feedstock for the very large US diesel fuel market. **Thus we have strong evidence of the suitability of this farm product for value-adding to an industrial product.** This work has resulted in published reports which will be available to potentially guide plant breeders and manufacturers of diesel fuel additives.
- c. Hatch Act
- d. State Specific

Stakeholder Input Process

The University of Georgia College of Agricultural and Environmental Sciences (CAES) in cooperation with the College of Family and Consumer Sciences and the Warnell School of Forestry, have many opportunities to collect stakeholder input.

The College of Agricultural and Environment Sciences established a liaison program about seven years ago. There are approximately 200 organizations and industries to which a faculty member (tenured or non-tenured) is assigned as a liaison. The faculty member may serve as a resource person, board member, attend board meetings or meet individually with members, in order to learn what is happening in that organization and/or industry. The CAES Dean meets with these liaisons once a year for a report. If there are important issues surfacing which need to be considered for action he ask for input.

The county faculty in the field are very active gathering input for the college. They do this in a variety of ways; advisory committees, being active with organizations and industries in their county, one-on-one input with clientele and by monitoring phone calls and office visit content for any trends. Every county is required to have an advisory committee in place and to meet with that committee at least twice a year. The membership of the committee must be reflective of the local population and knowledgeable of community issues appropriate for the University to address. County programs must develop county issues for the purpose of developing local Extension programs that have impact. This process offers a great deal of stakeholder input into the state program planning process. This is the best source of information from our end users.

Each CAES department also has individual methods for collecting input. Some departments have advisory committees, other are active in the industry's major organizations and other collect data from individual contact with industry representatives..

The College of Agricultural and Environment Sciences has an overall advisory council. The College of Agricultural and Environment Sciences Advisory Council was created in 1996 by consolidating the State Extension Advisory Council and the Georgia Agricultural Experiment Stations Research Advisory Board. This was done to reflect changes in the college and to help our stakeholders understand the equal importance of all functions of the College (teaching, research, and extension). The council seeks stakeholder counsel and advice to ensure that the programs of the College are responsive to the needs of Georgia residents. The Council members work closely with College faculty, staff and administrators in reviewing ongoing programs and identifying and planning high priority future programs.

The CAES Dean also meets with a coalition of approximately 50 agricultural commodity groups and agribusinesses known as the "Ag Round Table". The group meets quarterly with the Dean to provide discussion and input for the College.

Finally, the CAES Dean meets quarterly with key leadership within the state, including Georgia's Secretary of Agriculture, the Georgia Farm Bureau President and other key agricultural leaders.

Stakeholder input processes for The Fort Valley State University Research and Extension Programs employ diverse methodologies which allow for input from end users, including county advisory committees and individual clients, peers and other agricultural professionals, partners and cooperating agencies, including community-based organizations, and university administrators. The College of Agriculture, Home Economics and Allied has a college-wide advisory board for teaching, research and extension programs.

Annually, county-based professionals and para-professionals complete and submit survey instruments used to measure clientele needs for programs and services offered at the local level by the Extension Program. Concurrently, 1890 program clients are included on county-wide advisory boards which provide for development of individual county plans of work. Evaluations of programs conducted are also used to measure value of ongoing programs.

Agricultural researchers and extension specialists also use feedback gained from clients and others attending workshop and similar events to gather input on current and planned programs. At the same time, these agricultural professionals use peer-to-peer contacts, professional meetings, media reports and other data to gauge emerging issues and evaluate their relative value to identified needs of clientele. Active partnerships with community-based organizations also provide useful perspectives on issues and opportunities which may be integrated into research and extension programs.

University administrators also provide valuable input for program development and implementation as both research and extension programs are evaluated in terms of their relationship to the overall university mission. A major current focus is engaging the total university in the Land-Grant process.

The University of Georgia and Fort Valley State University Extension administrators, department heads, and district program leaders meet annually in a week long planning conference to share needs assessment, program results and programming ideas. The annual Extension Program Planning Week conference allows for the collaboration necessary to develop complementary and/or joint programming that meets the needs of the citizens of Georgia.

Program Review Process

There have been no significant changes in the review processes described in the Plans of Work submitted for Research and Extension programs of the University of Georgia or Fort Valley State University.

Evaluation of the Success of Multi-state and Joint Research/Extension Activities

The University of Georgia continues to make progress on its integrated research and extension programming. A very large percentage of the documented accomplishments in this report credit an integrated effort.

All of the state level faculty of the University of Georgia are administratively housed within an academic department. A large percentage of these faculty hold a joint research and extension appoint. This structure encourages a high level of integrated work.

The last few years have seen a great increase in county faculty becoming involved in integrated activities. Several integrated accomplishments in this report involve county faculty. This trend continues to increase.

The University of Georgia has increased its participation in Multi-state efforts during this program cycle. Recent budget cuts continue to increase the need for multi-state collaboration. Not always evident in a report of accomplishments are the many activities in which Georgia utilizes the out-of-state expertise in subject areas not well supported by current Georgia faculty.

There are many examples of multi-state accomplishments within this report. They are documented as multi-state and identify the states involved. The following are examples of multi-state and research/extension collaborations that are found in this report.

- The Georgia Beef Challenge helps build reputation and markets for Georgia cattle. This project done in collaboration with Iowa has helped counter a Georgia reputation of being inferior in quality and health status, thus reducing an estimated \$5 per hundred pound discount. Work with Tennessee has proved economic analyses comparing various management and marketing alternatives. This work has proved to increase profits measurably.
- Southern Region Small Fruit Consortium is a four state collaboration with outstanding impact. By combining resources, collaborative research has been conducted and shared across state lines. With no one state having resources to have major impact, this collaborative effort has had great success. In Georgia alone the work of the consortium has been substantial in an \$8 million increase in blueberry production in the last two years.
- The Center for Agribusiness and Economic Development was formed as a college wide Center jointly funded by Research and Extension. The Center concept allows for appropriate College Faculty to be matched with emerging food and fiber business opportunities. A dedicated staff of economist and data analyst provided support for the Center projects. Many individuals in Georgia's

agriculture community increase their profitability using the resources of this center.

- The scheduled withdrawal of methyl-bromide application has been the foundation of several collaborative efforts of extension and research in three states. Scientists are researching alternative systems to replace current practices with also working with farmers to maintain profitability during this uncertain time. While scientists were able to get a critical use exception, they are also actively pursuing critical multi-state research projects. The loss of MBr without a workable solution could cost vegetable producers over \$130 million in Georgia alone.
- Tomato Spotted Wilt Virus has become a major limiting factor to the production of tobacco, peanuts, and other crops in Georgia and throughout the Southeast. Losses due to TSWV have been as high as \$40 million in one year. Both Extension and Research faculty are involved in many multi-state collaborative to fight this problem. Successes like the introduction of Admire and the newly labeled Actigard on tobacco have been helpful. UGA research projects employing a multi-discipline approach that includes Plant Pathology, Entomology, Crop and Soil Science along with faculty from North Carolina State University and Clemson have been initiated with documented results in cultivar development.
- Research on the agricultural use of gypsum has the potential to prevent 26% of new home waste from entering the landfill. A research and extension collaborative effort is getting this information into the building industry in a timely manner while increasing awareness of the potential benefits.
- The management of animal waste and the development of required management plans for producers in Georgia is a major concern. Research and Extension scientists and county agents have come together in collaborative efforts in all parts of Georgia, from in-house composting research in poultry to assisting local farmers write and submit over 150 required nutrient management plans.
- The environmental management systems project (EMS) is the work of nine states to create a national framework and process for implementing environmental management systems for local producers. Georgia, which produces two million tons of poultry litter annually, is the lead state for work on poultry systems.

The following three exhibits include expenditures for the University of Georgia as requested.

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

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Multistate Extension Activities and Integrated Activities
(Attach Brief Summaries)

Institution University of Georgia, College of Agricultural and Environmental Sciences
State Georgia

Check One: **Multistate Extension Activities**
 Integrated Activities (Hatch Act Funds)
 Integrated Activities (Smith-Lever Act Funds)

Actual Expenditures

Title of Planned Program/Activity	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
Goal 1	569,247	564,280	560,355	558,508	
Goal 2	154,232	152,854	151,791	151,291	
Goal 3	0	0	0	0	
Goal 4	3,821	3,815	3,788	3,776	
Goal 5	127,947	126,827	125,945	125,530	
Total	855,247	847,776	841,879	839,105	

Georgia

Director

Date

**U.S. Department of Agriculture
 Cooperative State Research, Education, and Extension Service
 Supplement to the Annual Report of Accomplishments and Results
 Multistate Extension Activities and Integrated Activities
 (Attach Brief Summaries)**

Institution University of Georgia, College of Agricultural and Environmental Sciences
State Georgia

Check One: **Multistate Extension Activities**
 Integrated Activities (Hatch Act Funds)
 Integrated Activities (Smith-Lever Act Funds)

Actual Expenditures

Title of Planned Program/Activity	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
Goal 1	789,592	782,796	777,351	774,790	
Goal 2	66,095	65,517	65,062	64,847	
Goal 3	9,772	9,690	9,623	9,591	
Goal 4	190,100	188,404	187,093	186,477	
Goal 5	55,230	54,727	54,345	54,167	
Total	1,110,789	1,101,134	1,093,474	1,089,872	

Director

Date

Contact Information

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