AREERA Report of Accomplishment
University of Florida/IFAS
Florida A&M University/CESTA
Research (1862) and Extension (1862/1890)
Federal Fiscal Year
2004

This document is produced yearly through the efforts of all of Florida's 1862 and 1890 landgrant faculty and staff.

Please note that this document is designed for electronic use and best viewed in Print Layout. For clarity and efficiency many areas have links to specific information on multiple levels. The best way to use this document is to click on the links for specific areas on the Table of Contents, and returning before moving on to the next section.

April 1, 2005

This is to certify that I have seen and approved the Florida FY2004 Annual Report of Accomplishment for AREERA. This report contains the following:

UF/IFAS (1862) Research and Extension Report including Extension multi-state and Extension and Research integrated requirements.
FAMU/IFAS (1890) Extension Report

This is also to certify that Cheri Brodeur will be submitting this report with our knowledge and approval.

Signatures:

Dr. Richard L. Jones
Dean and Director, Research — Signature — 3/24/05 Date

Dr. Charles Magee
Interim Dean and Director
Land Grant Programs — Signature — 3/21/05 Date

Dr. Larry Arrington
Dean and Director, Extension — Signature — 3/24/05 Date

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II. EXECUTIVE SUMMARY

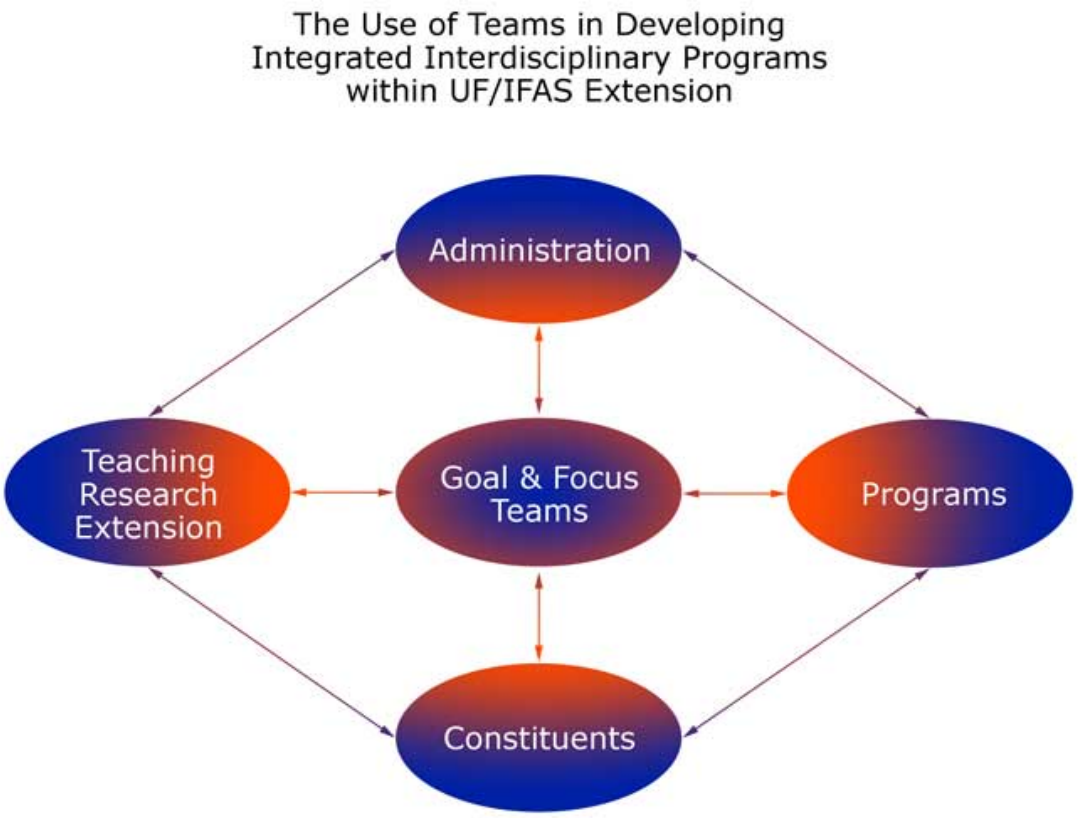
In 2004 UF/IFAS and FAMU/CESTA continued to improve their ability to capture research, extension and educational programs and activities involving federal and state funding. This has included the structural reorganization of extension as well as as the completion of a web-based faculty accountability system. Changes recommended in the 2003-2004 strategic plans have also been implemented which has improved the evaluation reporting process.

In 2004 the land-grant colleges in Florida dealt with senior administrative leadership changes as well as four major hurricanes and other natural disasters including severe flooding situations. Many of our faculty were personally affected by the devastation. Leadership changes impacted both universities and faculty. Florida A&M University changed administrative leadership at the Presidential level and the Dean for the College of Engineering Sciences, Technology and Agriculture position in FY 2004. In 2004, the University of Florida added a new president, a new VP for the Institute of Food and Agricultural Sciences, as well as changes in two of the IFAS deans (teaching and extension) and the announcement of the impending retirement of the research dean. However, these changes in leadership have not adversely affected either the 1890 or 1862 institution's ability to conduct impactual programs with their designated clientele. Also, in spite of these difficulties, 1862 faculty reached and in some cases surpassed the required 25% extension and research integration and also extension multi-state quotas.

Extension has seen the most changes during the past year primarily to improve accountability and strategic planning recommendations. Based on the strategic plan innovative organizational restructuring has taken place in extension. During 2003-2004 UF/IFAS Extension underwent a formal external review which made recommendation for changes within the organizational structure. Following a review of the State Major Programs (SMPs) by the committee it was recommended that Extension had too many SMPs (68). As part of the long-range planning process, the recommendations of the External Review Committee were adopted and the 68 SMPs have been reduced to 6 external goal team areas that relate to the 5 national goals. These state extension goals include:

i. To Enhance and Maintain Agricultural and Food Systems
ii. To Maintain and Enhance Florida's Environment
iii. To Develop Responsible and Productive Youth Through 4-H and Other Youth Programs
iv. To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow
v. To Assist Individuals and Families Achieve Economic Well-Being and Life Quality
vi. To Achieve Economic Prosperity and Community Vitality in Florida's Urban and Rural Communities

Each goal is further divided into three to five focus areas which were identified through the strategic plan. These focus teams are comprised of 1890 and 1862 Extension faculty, Research faculty, and many focus teams also include industry leaders in areas of agriculture, Family and Consumer Sciences, Energy, Marine and Natural resources and youth development. As part of the restructuring effort these teams are now empowered to identify and develop the programmatic structure of Florida Extension. The goal areas have undergone their first merit review and results are included in this document. Goal teams will use the results to improve their efficiency and effectiveness over the next year.
Below is the model that Florida Extension has adopted as part of their organizational restructuring within Extension. Florida Research, Teaching and Extension have also increase their interaction as can be seen by the model below. FAMU/CESTA besides being an integral part of Florida Extension has a strong tie with their research component especially in areas related to family and consumer science and small farm production.



In early 2005 UF/IFAS completed a faculty accountability system called unifas that culminates five years of effort. This system records all individual activities and publications for research, teaching and extension faculty. FAMU/CESTA are also apart of this system. Unifas, as the system is called allows the collection for the first time of focused, state aggregated data including impacts and outcomes. By the end of 2005 Florida hopes to be able to export into this system a fiscal component from the new fiscal system being adopted by the University of Florida. Through the use of this accountability system and changes occurring with in the Florida Land Grant systems we expect to be able to continue to meet the requirements of the AREERA Act of 1998.

III. AREERA CRITICAL NEEDS

National Goal 1

An agricultural system that is highly competitive in the global economy. Through research and education, empower the agricultural system with knowledge that will improve competitiveness in domestic production, processing, and marketing.

National Goal Summary:

The scope of challenges and opportunities facing agriculture and natural resource industries of Florida fall into four primary areas: 1) economic well-being, 2) environmental issues, 3) quality, safety and security issues, and 4) civic engagement.

In the area of well-being stake holders have identified critical issues related to:

1. Declining profitability due to stable or falling commodity prices and increasing cost of production.
2. Liberalized trade agreements that reduce tariffs and subsidies can benefit both foreign and domestic producers by having greater access to markets.
3. Resource limitations resulting from
    1. Land loss due to urban sprawl,
    2. Increased water consumption due to population growth,
    3. Restricted use of farm inputs due to environmental concerns, and
    4. Reduced availability of labor due to a growing reliance on migrant labor.
4. New and innovative products and processing technologies must be developed for the industry to remain competitive and to adequately meet the rising expectations of consumers.

The public concern over the following environmental issues has translated into increasingly stringent and costly environmental regulations on certain agricultural practices that can adversely affect a firm's economic viability in the short run and sustainability in the longer run. The Florida land grant college has focused on areas related to:

1. Water quality, as impacted by agricultural production practices, such as fertilizer and pesticide residue leaching and runoff, and management of waste from livestock and aquaculture production,
2. Water availability as impacted by production-related surface and groundwater withdrawals,
3. Conservation of the state's natural resource base, including land for production, wildlife habitat, green space, and fresh and saltwater recreation.

Concerning quality, safety and security critical issues related to national goal 1 there has been increased research and education related to:

1. A heightened awareness by agricultural producers and processors concerning safe production practices such as chemical residues, biological safety concerns, and personal hygiene practices.
2. Continued development of modern processing, distribution and storage, technologies and the use of improved handling practices that prevent unnecessary food losses while simultaneously ensuring high quality and safety standards;
3. Availability of a wide range of wholesome foods that meet the needs of an increasingly unhealthy population;
4. At the retail sector, adequate packaging and labeling so that consumers have reliable information to optimize their food choices;
5. Development and implementation of food safety and security programs that protect the nation's food supply, and;
6. Providing adequate information to the state and country's farm laborers who support agriculture to help them avoid dangers from equipment and exposure to farm chemicals that pose a number of potential risks to their health and safety.

Awareness of agriculture and natural resources and their contribution to the state's economic, environmental, and social well-being. Agricultural awareness efforts can create an informed voting public so that wise choices can be made that benefit Florida's citizens and visitors. The scope of these issues includes:

1. Educating the public regarding the role and importance of agriculture in Florida's economy, the stewardship of natural resources, and the relationship between agricultural production and food availability.
2. Keeping legislators up-to-date on industry concerns, such as pesticide regulations, worker protection standards, immigration, and international trade.
3. Providing public interest groups and the media with objective information regarding the contributions of the agricultural industry,
4. Developing information and programs that educate the industry regarding new information on such topics as Best Management Practices, regulatory legislation, and technological advancements.
5. Assisting the industry to promote the numerous benefits of agriculture.

Florida has been successful in accomplishments related to national goal 1 by focusing on areas related to:

1. Agricultural profitability and the sustainable use of environmental resources
2. Awareness of Agriculture's Importance to an Economy that ranges from local to global
3. Plant, animal and human protection
4. Processing, distribution, safety and security of food systems

Success Story: Small Farms/Alternative Enterprises Website Development – The first of the educational products delivered by the Small Farms/Alternative Enterprises Focus Team was an extensive new website, http://smallfarms.ifas.ufl.edu. This site was developed by the efforts of 17 topic leaders from within UF/IFAS and FAMU. The website was created to assist county extension faculty deliver educational programs and information to small farmers in Florida.

Florida's Performance Goal

To Enhance and Maintain Agricultural and Food Systems

For a view of all Florida's accomplishments and success stories in this document related to national goal 1 click on the link below.

Related Extension Programs and Research Projects

National Goal 2

A safe and secure food and fiber system. To ensure an adequate food and fiber supply and food safety through improved science based detection, surveillance, prevention, and education.

National Goal Summary:

Florida is a rapidly growing state with a very diverse population. Many Floridians face special needs and issues that must be addressed. Lifestyle related chronic illnesses, such as diabetes, obesity, and circulatory diseases are on the rise. Poor food choices create health and developmental related problems for people of all ages, and are of critical concern for young mothers and their infants. Florida is one of the top 10 states nationwide in the incidence of food-borne diseases. Of these, about half are attributed to food service operations.

To reduce the quality, safety and security issues the Florida 1890 and 1862 land grant colleges have developed a strong research and education component in these areas which have:

- A heightened awareness by agricultural producers and processors concerning safe production practices such as chemical residues, biological safety concerns, and personal hygiene practices.

- Continued development of modern processing, distribution and storage, technologies and the use of improved handling practices that prevent unnecessary food losses while simultaneously ensuring high quality and safety standards;
- Availability of a wide range of wholesome foods that meet the needs of an increasingly unhealthy population;
- At the retail sector, adequate packaging and labeling so that consumers have reliable information to optimize their food choices;
- Development and implementation of food safety and security programs that protect the nation's food supply, and;

7. Providing adequate information to the state and country's farm laborers who support agriculture to help them avoid dangers from equipment and exposure to farm chemicals that pose a number of potential risks to their health and safety.

One success in food safety: More than 75 educational programs were conducted reaching an audience of more than 11,000 people on processing, distribution, safety and security of food systems. Food processing, service, preparation, and distribution are all vital activities that support the people of Florida and the state's
agricultural industry. New and value-added product development contributes to a viable market for Florida products and provides for the array of products consumers expect. Effective distribution systems also enhance the state's ability to compete effectively in the domestic and global marketplace. As a result of these educational programs there has been an increase in improved food harvesting practices, improved food processing practices, and improved safety and security at the retail level.

Florida has successfully accomplished the national goal 2 objectives for 2004. For a view of all Florida's accomplishments and success stories in this document related to national goal 2 click on the link below.

Florida's Performance Goal

Processing, Distribution, Safety and Security of Food Systems
Related Extension Programs and Research Projects

Florida's Performance Goal

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality
Related Extension Programs and Research Projects

National Goal 3

A healthy, well-nourished population. Through research and education on nutrition and development of more nutritious foods, enable people to make health promoting choices.

National Goal Summary:

Nutrition, Food Safety, and Health Extension education programs address critical issues that affect the health and well-being of individuals, families and communities in Florida. Floridians who adopt healthful lifestyle behaviors will improve their nutritional status and health, and help reduce Florida's $77 billion annual health care bill.

Chronic diseases such as heart disease, cancer, stroke, and diabetes are related to lifestyle choices, and risk for these conditions can be reduced through behavior change. Heart disease and stroke are consistently the number one and three causes of death in the state, with 48,129 and 9,873 deaths, respectively, occurring in 2003. Cancer is the second leading cause of death in Florida, with 39,238 deaths occurring in 2003. Diabetes, the seventh leading cause of death in Florida, is one of the most

expensive of the chronic diseases, with nationwide costs of $92 billion for direct medical expenditures in 2002. An estimated 1 million adults in Florida have diagnosed diabetes and another 300,000 to 400,000 have undiagnosed diabetes. The incidence of overweight and obesity in Florida is rising. Among adults in the state, 35.1% are overweight and an additional 22.3% are obese. Obesity increases risk for diabetes, and risk of death from cardiovascular disease and cancer. Dramatic increases in overweight among children and youth need to be addressed to reduce risk of lifelong health problems.

According the Centers for Disease Control and Prevention, 76 millions cases of foodborne illness occur each year in the U.S., with over 500,000 hospitalizations and 5000 deaths. Each year the economic impact of foodborne illnesses ranges from $6.5 to $35 billion. Florida ranks as one of the top 10 states in the incidence of foodborne disease. National CDC surveillance data show that more than 50% of reported foodborne illness cases are attributed to foodservice operations.

Proper nutrition and safe food is important for people at all stages of life and in all life conditions, but is especially critical during pregnancy, for young children and elders, for persons with limited resources, and for persons with conditions that compromise their immune systems. Pregnant women are at increased risk for severe effects of certain food borne pathogens that can adversely affect their babies. Pregnant teens are more likely than more mature women to have low birth weight babies, and are less likely to breast feed their babies. Food habits affect the growth and development of young children, as well as their risk for overweight and associated health conditions such as high blood pressure and diabetes. Very young children are more likely to suffer severe consequences when exposed to food borne pathogens. Florida ranks number one in the nation in the percentage of the population that is 65 years and older. Older adults, particularly those with limited resources, are at risk for malnutrition and for serious effects of food borne illness. Persons with limited resources are at increased risk for malnutrition and adverse health outcomes. In 1999-2001, an estimated 12.2% of households in Florida were food insecure, with or without hunger and 4% were food insecure with hunger. Florida has the second highest incidence of AIDS in the US, an illness that predisposes people to the most severe consequences of foodborne illness.

Lifestyle choices, such as diet, physical activity, and food handling practices affect short- and long-term health risks. For example, when people change their behaviors toward a healthier lifestyle, and seek and receive care at the appropriate time, they can reduce their risk for the major chronic diseases such as heart disease and stroke. Also, persons with existing diseases, such as diabetes, can reduce risk for debilitating and expensive health complications through lifestyle changes. Use of recommended safe food handling practices in the home and by food handlers can reduce risk of food borne illnesses. Persons with limited resources can reduce their risk of food insecurity and hunger by learning to manage their resources effectively.

Extension nutrition, food safety, and health education programs give people the knowledge, motivation, and skills they need to adopt behavior changes that promote positive nutritional status and reduce health risks throughout the life cycle. Some of the key behaviors that can help promote positive nutritional status and reduce health risks among various target audiences include:

- increasing intake of fruits, vegetables, and whole grains;
- moderating intake of total fat, sodium, and added sugars;
- decreasing intake of saturated and trans fat;
- including food sources of key nutrients for their gender and life stage
- using safe food handling practices;

- managing food resources effectively;
- increasing physical activity; and
- participating in recommended health screenings.

Healthy lifestyle practices should begin in childhood, when lifestyle habits are formed, within the context of the family and community. By educating young people themselves, and helping their parents and caregivers model healthful lifestyle practices, Extension can encourage healthy eating and physical activity patterns that promote a healthy body weight and reduce short- and long-term health risks. Middle-aged adults, particularly those faced with risk factors such as hypertension, may be responsive to educational interventions designed to reduce health risks, and older adults can be encouraged to reduce their nutrition and health risks through adoption of healthier lifestyles at any age.

Changes in lifestyle behaviors that lead to reduced health risks can have dramatic impacts on skyrocketing health care costs. For example, it has been estimated that for every person who reduces his/her need for artery-clearing procedures or surgery by adopting heart healthy lifestyle changes, an estimated $10,930 is saved. Persons with diabetes who improve blood glucose control help to decrease medical costs of diabetes, which doubled from $44 billion in 1997 to $92 billion in 2002. The cost of an individual case of foodborne illness resulting in death is estimated to be $42,300. Extension programs that educate and motivate individuals to adopt healthy lifestyle behaviors using information obtained through research has significantly impacted health care costs in Florida while improving quality of life.
Success story: The use of cost effective strageties led to the reduction of food costs for EFNEP families. The average reduction in food cost of $2.12/family each month indicates that an overall monthly savings of $2223.88 occurred with a yearly reduction in food costs of $26686.56. As a result available additional dollars allowed families to purchase, prepare and consume more healthy foods.

Florida has successfully accomplished the national goal 3 objectives for 2004. For a view of all Florida's accomplishments and success stories in this document related to national goal 3 click on the link below.

Florida's Performance Goal:

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality
Related Extension Programs and Research Projects

National Goal 4

Greater harmony between agriculture and the environment. Enhance the quality of the environment through better understanding of and building on agriculture's and forestry's complex links with soil.

National Goal Summary:

Natural resources (water, flora, and fauna) contribute significantly to the Florida economy and are important components of the quality of life for many residents and tourists. At least half of the respondents to a 1999 survey indicated that prevention of water pollution (72%), protecting the marine environment (64%), and conservation of wildlife habitat and endangered species (50%) were "high priority" educational program needs for their communities. And yet, many issues threaten these valuable assets. Florida ranks third among states in the number of plants and animals federally listed as being in danger of becoming extinct, and half of all Florida's non-marine vertebrates are declining in number. Problems caused by invasive, non-native species in Florida also rank as some of the most severe in the country and threaten wildlife, habitats, and ecosystems. Florida is also one of the most rapidly growing states in the country and expanding agriculture and urbanization contribute unique challenges to natural resource conservation and ecosystem function.

The objectives of UF/IFAS and FAMU/CESTA programs and projects are intended to promote the continued existence, function, and sustainable use of Florida's natural resources for the benefit of Florida both today and in the future. These objectives are met by providing science-based information to persons that:

1) develop policies that affect natural resources in Florida,

2) implement education, management, conservation, and restoration actions that influence natural resources and ecosystems in Florida, and

3) consume, enjoy, or otherwise benefit from the existence of natural resources and functional ecosystems in Florida.

Many environmental challenges are exacerbated by human activity. Extension programs have the capacity to raise awareness, provide information, build skills, demonstrate alternatives, and change behaviors that will enhance the quality and quantity of Florida's natural resources. Enhancing the environmental educators' skills, resources, and programs are the mechanism for enhancing the effectiveness of these Extension programs.

Florida is also a saltwater state. The whole state falls within the legally defined coastal zone. Its estuarine, coastal and marine systems stretch further than all the other Atlantic states from Georgia to New England. Because they cover six degrees of latitude, Florida’s estuarine, coastal and marine systems warrant targeted approaches to research, management, outreach and communications that translate generic information to local applications. Florida’s estuarine, coastal and marine systems produce over $5 billion in fisheries and wildlife resources each year, buffer coastal areas from storms, absorb pollutants and provide amenities for coastal settlement, trade and tourism, including over 1 million boaters and divers per year. In addition, over 75% of Florida’s population lives in its 35 coastal counties. Hundreds of thousands of acres of seagrass meadows, salt marsh grasses and mangrove forests are critical habitats for sea trout, redfish, oysters and blue crabs, and a total of 80%–90% of the state’s commercial and recreational fishery species. If we want the benefits we derive to continue, then we all must act as knowledgeable and concerned stewards.

The environmental quality that underpins all of this ecological and economic productivity is under increasing threat from a wide range of human activities. Many of the obvious impacts on coasts and estuaries are being managed more effectively. For example, outright destruction by dredging and reclamation has largely stopped, and point source inputs, such as sewage and industrial discharges, are being reduced or eliminated. However, the sheer numbers of people living in Florida increase potentially damaging inputs that enter coastal waters via watersheds and non-point sources (e.g., runoff). These diffuse inputs are harder to manage, in part because they involve the actions of numerous, individual citizens including those that live far from the coast. For example, household pesticide use is one factor that leads to five of Florida’s estuaries being among the ten U.S. estuaries most threatened by pesticides. In addition, historical losses of 50% of the salt marsh, 60% of the seagrass and 85% of the mangroves in some of Florida’s estuaries need to be repaired. The sustainability of coastal systems and the value they provide requires an understanding of their natural functioning, responses to population growth, extractive and non-extractive uses and other anthropogenic pressures and responses to management efforts being spearheaded by Florida research and extension.

Successful approaches to the challenges facing Florida’s estuarine, coastal and marine systems require innovative and collaborative work. 'Conservation and sustainable use of coastal and marine natural resources and ecosystems' provides focus for work on a variety of challenges facing all Floridians,

residents of other states who live in watersheds that pass through Florida, all visitors to these areas, and UF/IFAS Extension and Florida Sea Grant faculty. The challenges we face represent 'wicked problems', which means that improvements to the current situation require an iterative approach to problem definition and testing of potential solutions through research and field testing. Education and outreach play critical roles because all stakeholders must be continually involved in a meaningful fashion if any solution is to be accepted. This focus Florida landgrant is using is improving the current situation by joining with other Florida focus areas to:

1) characterize the 'wicked' nature of the problem;

2) translate existing scientific findings into potential solutions for testing, with science broadly defined to include physical, chemical, biological, economic, social and political approaches;

3) highlight critical gaps in our knowledge and research efforts to fill them;

4) facilitate innovative decision-making processes; and

5) encourage public involvement and stewardship.

The impact hinges on promoting increased awareness and understanding of ecological, economic, social and management principles and processes among citizens, professionals and agency personnel which programs and projects in 2004 show to be successful. Tangible results include an increased involvement of citizens in coastal and estuarine monitoring and management, an increased use of key ecological concepts in discussions held by state and federal management agencies, and an increased awareness and use of adaptive and participative management.

Success Stories: More than 160 educational programs were conducted for more than 1 million individuals. Residents are taught environmentally friendly landscape methods, landscaping methods for enhancing wildlife in urban settings, efficient use of inputs for landscape management, decreased landscape costs, pesticide usage, disease problems, and inefficient use of water. In addition this focus area also involves the training of Master Gardeners who assist within the county extension offices and community in making landscape recommendations, do soil testing, identify pests and develop demonstration gardens throughout the community as well as working with school gardens. These programs reduce pesticide usage, water usage, and fertilizer usage for home landscapes and gardens. They develop a cadre of speakers to speak to community clubs. School garden programs assist youth in developing leadership and life skills.

For a view of all Florida's accomplishments and success stories in this document related to national goal 4 click on the link below.

Florida's Performance Goal

To Maintain and Enhance Florida's Environment
Related Extension Programs and Research Projects

Florida's Performance Goal

To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow
Related Extension Programs and Research Projects

National Goal 5

Enhanced economic opportunity and quality of life for Americans. Empower people and communities, through research-based information and education, to address economic and social challenges facing our youth, families, and communities.

National Goal Summary

Communities in Florida are impacted by a number of forces that are national or international in scope, and they face a range of problems including growth management, affordable housing, economic development, overcrowded schools, and environmental protection while trying to provide adequate care for children, the elderly, and low income families and individuals. Florida is the nation's fourth largest state with a current population that exceeds 16 million, and population is expected to reach 20 million by the year 2020. The largest absolute population gains will be in existing urban areas, the fastest growth rates are expected in more rural counties located near the urban areas, and other smaller, rural counties in the southern interior and in the northern parts of the state will experience lower levels of population growth and economic development.

Communities also face pressure from a number of broader social and economic trends. There is a restructuring of the traditional family towards single-parent households and towards households where both parents work, local governments are becoming more specialized in response to more complex state and federal regulatory requirements, economic restructuring has resulted in the decline of traditional jobs and increased numbers of jobs in knowledge oriented industries. Agriculture in rural areas is increasingly dependent on the local economy to provide off farm income, and in urban areas of Florida, high-value crops are competing with urban interests for land and water resources.

In short, the story in Florida is one of profound and prolonged change. As a result, Florida communities and their citizens face a complex set of issues that lend themselves to involvement and engagement on the part of concerned citizens and community groups. Such involvement, however, requires educational programs to develop leadership and analytical skills and programs to provide information on alternative methods for approaching problems.

In this environment citizens are increasingly called upon to decide complex issues either through traditional voting procedures at the state and local level or through participation in various meetings, committees and other venues whereby citizens influence government action or organize to take action in some other manner to address a range of problems. The range of opportunities for citizen participation and the complexity of the issues support a need for education programs in a variety of formats to include training for citizen participants and local government officials dealing with the same set of issues.

Florida Extension and research are focusing on:

1. Public policy education: Includes programs focused on particular policy issues (ie; growth management, smart growth, land use regulation, water management, economic development, etc.). Focus is on understanding policy issues, alternatives approaches to solutions, and consequences of the alternatives.

2. Leadership training: Programs focused on developing a trained cadre of citizen leaders at the local and state level to attack the multitude of local problems faced statewide.

3. Technical Assistance: Programs providing technical assistance to local groups, organizations and governments engaged in economic and community developoment activities. Includes facilitation, assistance with strategic planning and visioning, and policy analysis.

Another area of concern related to quality of life for Florida citizens is shelter. Shelter is one of the three essentials for mankind. Floridians spend from one-third to almost one-half of their disposable income for housing. It is an important health concern, as well as a financial consideration. One's residence also impacts the social and emotional well-being of its' occupants.

Florida faces several different housing challenges; including the availability of affordable, quality housing for low and limited income families, housing for the elderly and physically challenged, structurally sound housing to withstand hurricane force winds, and housing that provides good indoor air quality in a warm and humid climate. Also, Floridians must consider the removal and disposal of lead house paint from old structures, and the challenge of ensuring that professional builders have the knowledge needed to build houses that address energy, environmental and structural needs. Florida's rapid growth in population places additional stress on its housing situation.

By learning to better manage their available resources and resolve credit problems through extension educational programs, limited resource families are qualifying for low-interest home loans with payments equivalent or less than they pay for rent. Home ownership improves neighborhoods, reduces crime, and increases the local tax base. Through simple retrofitting, the elderly and physically challenged are able to live independently and live longer in their homes. They are happier and it saves money for the state and individual. Respiratory problems, responsible for most school absences, and other health-related problems could be substantially reduced by improving indoor air quality. Most problems result from lack of knowledge and are easy to correct.

Extension is working cooperatively with regulatory agencies to enact codes needed to ensure homes are “hurricane resistant.” The four hurricanes that ravaged Florida in 2004 show this is critical. The construction industry is being trained and the public informed. Florida Extension has the information base, established programs, and delivery system needed to address the state's housing problems. Trained professionals in each of Florida's 67 counties provide programming for local residents. Several counties also fund a professional Extension Agent to work exclusively in housing. Extension also works cooperatively with other organizations and agencies to reach and teach target audiences, for example, SHIP, Habitat for Humanity, and other affordable housing programs.

Along with housing issues Florida has to deal with aging demographics. The population of Florida continues to grow older as residents age and as aging individuals and couples move to Florida. It is projected that almost half of Florida’s population growth in the next 25 years will be people age 65 and over, that is by 2025 the over 65 group will make up 26.33 percent of Florida’s population. The Employee Benefit Research Institute projects that, if the current trend continues, by 2030 there will be a $45 billion short fall in funds needed to cover basic expenses of retirees. Most at risk are low-income single women, who typically lack the resources needed to save for their retirement years.

Many Floridians are relying on Social Security as their retirement income even though it is designed as a supplement and not the total retirement income. Average Social Security benefits for all of Florida’s beneficiaries age 65 and older in 2000 was only $818.89 per month. This is below poverty level. According to the National Fraud Center, Florida is one of the 10 states experiencing the greatest problem with fraud. Older Floridians are especially vulnerable to con artist and fraudulent scams.

Poverty is a problem in other levels of society besides the elderly. In 1998, 13.6 percent of Florida’s population lived in poverty. That same year 22 percent of Florida’s children under 18 lived in poverty. Florida’s per capita income in 2001 was $28,493, only 94 percent of the national average.

As we begin the 21st century the family faces many challenges. The highest national debt level in history, a staggering consumer debt load, and runaway health care costs are major problems facing all Americans.

Also of great concern is poor money management skills, overextended credit, limited life skills, a soaring school dropout rate the continuous move toward a service economy, and public issues of urban and rural families, the elderly, minorities, individuals, youth, farmers, and displaced farmers. Credit has become a way of postponing financial crises. According to the Federal Reserve household debt has hit a record high - 109 percent of household income; personal savings - a all time low; and personal bankruptcies are up 29 percent in the past five years. In 2003, 32,170 non-business bankruptcies were filed in Florida- up 5% from 2002.

Last year American teenagers spent over $172 billion. That is about $5,400 each. Findings from a recent study sponsored by Jump $tart www.jumpstart.org show that teenagers receive a failing grade in money management. That is students could answer only half (50.2%) of financial management questions correctly.

Recent studies indicate a growing need for families to become more sophisticated in their financial decision making skills. The management of personal finance has become very complex with intricate tax laws, fluctuating interest rates, increase in the use of electronic technology by the financial industry, and proliferation of insurance products. At the same time, 28% of the adult population cannot correctly make change in a financial transaction. The Consumer Federation of America conducted a nationwide survey of consumer knowledge and found that participants gave correct answers to only 54% of 249 questions. (Adults fared little better than teens.) Results showed that Americans are somewhat knowledgeable about taking prescriptions and over the counter drugs, about automobile repairs and maintenance and rental housing. On the other hand, they knew relatively little about purchasing a house and only slightly more about life insurance, checking and savings accounts, and food purchases. Eighty-seven percent of today's consumers are value conscious, they want top quality. But one in three find shopping stressful and consider it to be an inefficient use of their time.
The cost of housing has increased from 20.2% of the family budget in the 1900's to about 35% in 2000. This includes utilities, furnishings and repairs as well as the cost of housing. Health care costs have steadily increased and there is no sign of this stabilizing or reversing. The cost of health care is beyond the reach of many families. In 2000, 20.5 percent of Floridians under 65 had no health insurance. Long-term health care is not affordable for most people. Nursing home stays average as much as $40,000 per year, with long term health care insurance topping $2,000 per year.

Modern medicine and technology have extended the life expectancy, but living longer does not necessarily mean living better. The issues concerning Floridians today include outliving retirement benefits, threats to Social Security, asset transfer and estate management, elder care cost, affordable health insurance and the growing number of children and adults with no health insurance.

Limited resource families, individuals, and youth lack consumer education and life-long skills such as decision making, financial management, time management and management of other resources. Most consumers are interested in inequities of family legal matters. Yet studies show that two-thirds of Floridians die without a will and one third of Floridian are unbanked.

Extension has the capacity to respond to the Needs of Florida's Families.The University of Florida Extension provides program participants with the research-based information, strategies and skills needed to make behavior changes that will improve the individual's quality of life as well as improve the resources of the state.

State Extension faculty members have graduate degrees in consumer education and family economics. One member is a Certified Financial Planner. They have experience working with individuals and

families to help families better manage resources and improve their quality of life. State faculty use sound models to develop programs and educational materials to meet the needs of Floridians. Programs usually consist of a series of lessons with a minimum of six hours of contact. The faculty also participate in a daily radio program on PBS to share cutting edge research information that impacts the family and the family's finances. See www.familyalbumradio.org.

County faculty, who are educated in Family and Consumer Sciences, Consumer Economics and Human Development and are experienced in adult education, deliver programs statewide. Extension is able to reach youth, young adults, adults, and older adults who can benefit most from these programs. Financial management, family economics, and consumer education programs are offered at convenient sites such as: schools, community centers, places of worship, the work place, health departments, and prisons. Outreach is further enhanced with the assistance of trained volunteers and through media such as radio and television spots and interviews, newsletters, and articles in local newspapers.

Because of its access to research based information, educational methodologies, and state and local infrastructure, Florida Extension is a strong partner to many organizations including, American Association of Retired Persons, Florida Highway Patrol, Community Colleges, Attorney General's Office, Florida Department of Financial Services, Florida Department of Agriculture & Consumer Services, Council on Aging, Consumer Credit Counseling Service, Department of Education and high schools. Extension contributes to partnerships in a number of ways such as in-service education for agency staff, direct educational programming with clientele and providing up-to-date education resource materials. By working together Extension and its collaborators offer a more comprehensive program with both education and service, consequently, increasing the impact for Floridians.

Youth is an important component of Florida extension. 4-H utilizes a variety of project and subject matter skills to engage youth in areas of interest. Subject matter programs and projects, additionally, become the "vehicle" through which youth engage with other adults, become self-directed learners, set goals, make independent choices and decisions, and gain mastery and accomplishment from their experiences.

Florida 4-H programs target youth development "life skills" as outcomes for young people through the outreach education of subject matter educational programs and projects of the land-grant university. Through extension programs youth are learning to :

- Effectively communicate with others;
- Develop and maintain positive relationships with others;
- Process information to make effective decisions and positive choices;
- Lead and contribute to others (peers, family, community);
- Demonstrate marketable/productive skills for work and family life.

. These skills transcend into economic self-sufficiency, positive family and social relationships and community involvement in adulthood. Research studies indicate that the more internal assets and life skills/competencies youth build the more likely they are to grow up healthy, confident, responsible and are less likely to become engaged in risky behaviors.

For a view of all Florida's accomplishments and success stories in this document related to national goal 5 click on the link below.

Florida's Performance Goal

To Develop Responsible and Productive Youth Through 4-H and Other Youth Programs

Related Extension Programs and Research Projects

Florida's Performance Goals

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality

Related Extension Programs and Research Projects

Florida's Performance Goals

To Achieve Economic Prosperity and Community Vitality in Florida's Urban and Rural Communities

Related Extension Programs and Research Projects

IV. RESEARCH PROJECTS AND EXTENSION PROGRAMS

Goal 1

An agricultural system that is highly competitive in the global economy. Through research and education, empower the agricultural system with knowledge that will improve competitiveness in domestic production, processing, and marketing.

Agricultural Profitability and the Sustainable Use of Environmental Resources

Research:

ANS-04111	ANS-03821	BRA-03764	FOS-03764	HOS-03700	MCS-03861
AGR-03667	ANS-03859	BRA-04012	FTL-03602	HOS-03822	ONA-03726
AGR-03706	ANS-03818	DOV-03764	FTL-03609	HOS-04108	QUN-03609
AGR-03854	ANS-03980	ENH-04069	FTL-03620	JAY-03609	QUN-03854
AGR-03726	APO-03523	ENH-03600	FTL-03711	JAY-03620	QUN-03706
AGR-04076	APO-03609	ENH-03602	HOM-03998	LAL-03571	
AGR-04083	APO-03875	ENH-03609	HOS-03675	LAL-03770	
ANS-03659	BRA-03609	ENY-04012-L	HOS-03601	LAL-04057	

Awareness of Agriculture's Importance to an Economy That Ranges From Local to Global

Research:

ANS-03821	APO-03875	ENY-04011	FRE-03599	FYC-03960	PLP-03588
ANS-03859	BRA-03609	ENY-03723	FRE-03701	IMM-03571	
APO-03523	BRA-03764	FOS-03741	FRE-03863	LAL-03571	
APO-03609	DOV-03764	FOS-03910	FRE-04005	MCS-03861	

Plant, Animal and Human Protection

Research:

AGR-03594	FTL-03754	ENY-03961	FTL-03607	IMM-04012	QUN-03693
ANS-03859	BGL-04012	ENY-04011	FTL-03620	JAY-03620	
AGR-04083	BRA-04012	ENY-04012-W	FTL-04066	LAL-03897	
ANS-03659	DOV-03586	ENY-04025	FTL-03807	PLP-03586	
APO-03523	ENY-03694	FME-03966	FTP-03700	PLP-03524	
APO-04012	ENY-03942	FTL-03539	HOS-03729	PLP-03603	

To Maintain and Enhance Florida's Environment
Water Resources

Research:

To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow
Green Industries' BMPs Program

Research:

FTL-03711 JAY-03609

Commercial Horticulture/Urban Forestry Service

Research:

BRA-03609	ENH-03600	ENH-03602	ENH-03609	FTL-03609	JAY-03609

QUN-03609 QUN-03854

The Importance of Diagnostic Tools
Research:
LAL-03571

Goal 2
A safe and secure food and fiber system. To ensure an adequate food and fiber supply and food safety through improved science based detection, surveillance, prevention, and education.

To Enhance and Maintain Agricultural and Food Systems
Plant, Animal and Human Protection
Research:
FME-03966 FRE-03571 FTP-03700 HOS-03559 PLP-03586 FRE-03597
FOS-03910 FTL-04047 FYC-03960 LAL-03571 PLP-03588

Nutrition, Food Safety, and Health
Research:
FOS-03910 FYC-03960 HOS-03559 PLP-03588

Goal 3
A healthy, well-nourished population. Through research and education on nutrition and development of more nutritious foods, enable people to make health promoting choices.

To Enhance and Maintain Agricultural and Food Systems
Plant, Animal and Human Protection
Research:
FME-03966 ENY-03694 FOS-04098

Parenting, Families, and Care
Research:
FOS-03513

Nutrition, Food Safety, and Health
Research:
FME-03966 FOS-03513 FOS-04098 FOS-03840 FYC-03960 FYC-03960

Goal 4
Greater harmony between agriculture and the environment. Enhance the quality of the environment through better understanding of and building on agriculture's and forestry's complex links with soil, water, air, and biotic resources.

Research:
ABE-04016 ENY-03788
Extension:

Water Resources
Research:
IMM-03622

Conservation and Sustainable Use of Freshwater and Terrestrial Natural Resources and Ecosystems

Research:

IMM-03622	AGR-03983	FTL-03711	JAY-03609	QUN-04012	SWS-03711
AGR-03594	FTL-03539	HOM-03998	LAL-03788	SWS-03820	WEC-03618

Environmental Education

Research:

Conservation and Sustainable Use of Coastal and Marine Natural Resources and Ecosystems

Research:

FRE-03863

Residential Landscapes

Research:

FTL-03711	JAY-03609	SWS-03820

Commercial Horticulture

Research:

JAY-03609	SWS-03820

To Enhance and Maintain Agricultural and Food Systems

Agricultural Profitability and the sustainable use of Environmental Resources

Research:

BGL-04012	HOM-03998	LAL-03770	SWS-03820
FTL-03711	JAY-03609	QUN-04012	

Awareness of Agricultural importance to an Economy that ranges from local to global

Research:

Plant, Animal and Human Protection

Research:

APO-04012	ENH-03669	ENY-04025	FTL-03539	HOS-04031	LAL-03788
BGL-04012	ENY-04011	ENY-04012-W	FTL-03754	IMM-04012	QUN-04012
BRA-04012	ENY-03796	FME-03966	FTL-03807	LAL-03897	PLP-03603

Goal 5

Enhanced economic opportunity and quality of life for Americans. Empower people and communities, through research-based information and education, to address economic and social challenges facing our youth, families, and communities.

Housing and Environment

Research:

FYC-03923	SWS-03711	ENH-03669

Life Skills Development
Research:
FYC-03923

Organizational Development
Research:
FYC-03923

Volunteer Development
Research:
FYC-03923

Nutrition, Food Safety and Health
Research:
FRE-03584 FRE-03660 FRE-04005

Parenting, Families, and Care
Research:
FYC-03923

Financial Management and Economic Well-Being
Research:
FRE-03660 FRE-04005

Housing and Environment
Research:
FTL-03607

Economic Development and Community Services and Infrastructure
Research:
FRE-03599 FRE-03863

V. RESEARCH IMPACT STATEMENTS

Project Number: FLA-ABE-04016
Title: ***DEVELOPMENT AND EVALUATION OF TMDL PLANNING AND ASSESSMENT TOOLS AND PROCESSES***
Critical Needs:
National Goals: 1,4
Key Themes: environmental models; ecosystems; ecosystem management; watershed management; agricultural land; hydrologic models; water quality; nutrient transport; geographic information systems; pasture management; agricultural practices; best management practices; uncertainty; water flow; pollution control; engineering; water pollution
Summary: Agricultural management practices can be used to reduce the impacts of agricultural production on water resources, but it is difficult to quantify these effects. This project develops, improves, and evaluates watershed models and other approaches for TMDL development and implementation to assess and control impacts of agricultural practices on water resources.
Progress: FHANTM, EAAMOD, and ACRU2000 are being evaluated to determine their applicability for TMDL development in the Lake Okeechobee basin. The models are being tested using data from ongoing BMP demonstration projects on beef ranches in south Florida. FHANTM and EAAMOD were calibrated using runoff and water quality data from a 16-pasture research study started in 1998. Data from 1998-1999 were used in the calibration phase. Data from the same pastures for 2000-2001 were used as an independent verification of the models' performance in predicting runoff and nitrogen and phosphorus loadings from the pastures. Both models were accurate enough to perform screening applications, however neither model accurately tracked the variations in runoff and nutrient loads over the simulation period. Management activities performed on the pastures could not be represented adequately with either model. An initial application of the ACRU2000 model to these pastures indicated some model modifications needed to improve its performance on these sandy, flat, high-water-table pastures. Modification of ACRU2000 to implement these changes is currently in progress. Measurement of pasture runoff and water quality data are continuing in support of this model evaluation research and a new study is being installed on another ranch to provide larger watershed-scale research data for use in continuing model evaluation on a larger ranch scale.
Impacts: Effective TMDL development and implementation requires knowledge of the effects of Best Management Practices proposed for use in meeting established TMDLs. Modeling tools are extremely valuable in this process because of the lack of adequate water quality and flow data to determine this information. Use of validated models in the development process will result in more efficient planning and more effective TMDL plans.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-AGR-03594
Title: ***FORMATION, SPROUTING AND LONGEVITY OF HYDRILLA TUBERS***
Critical Needs:
National Goals: 1,4
Key Themes: weeds; aquatic weeds; plant reproduction; hydrilla; tubers; hydrosoil; sprouting; environmental factors; weed control; lakes; ponds; ecosystem management; vegetative propagation; natural areas; longevity
Summary: The submersed aquatic weed hyrdilla invades waterways of the southeast U.S., displacing native vegetation, and adversely impacting irrigation, flood control, recreation and public health. Long-term control strategies must include depletion of populations of hydrilla tubers. This project examines

factors that influence the production, longevity and germination of hydrilla tubers, with the objective of improving long-term control of hydrilla populations.
Progress: A greater understanding of the dynamics of subterranean turions (tubers) of hydrilla is critical to developing improved management programs for this invasive, exotic aquatic plant. The vertical distribution of hydrilla tubers in lake hydrosoils and tuber location in the sediment did not affect subsequent sprouting potential. Mesocosm studies (900 L tanks) indicated that removing the vegetative canopy of hydrilla does not affect the rate of tuber sprouting, however, control methods that kill the root system increased sprouting rates by 20 to 48 percent (independent of tuber age). Tuber sprouting was much greater in sand than in organic or loam sediments following mechanical or herbicide treatments. Changes that occur in the microenvironment where roots and tubers are closely associated, likely stimulated sprouting in mesocosm studies. Tuber populations were monitored over a 30 month period in research ponds in North Florida and showed no difference in sprouting between untreated control ponds and treated (vegetation removed) ponds. Monthly sprouting rates generally remained below 3 percent, with peaks (5-7%) noted in the Fall. Limited tuber production in untreated systems is attributed to reduced rootcrown density (loci for tuber production) due to intraspecific competition. When management was stopped at 27 months, tubers were replenished to near pretreatment densities within 3 months. Laboratory studies show that once a tuber is disturbed following its removal from the sediment, the likelihood of sprouting increases linearly with time through 48 hours. Use of disturbed tubers in laboratory studies may confound results depending on the length of time the tuber has been removed from the sediment. Laboratory evaluations suggested that exogenous application of abscisic acid at concentrations as low as 0.05 to 1.0 micro-molar strongly inhibited tuber sprouting under both aerobic and anoxic conditions; however, this effect was partially overcome by addition of GA3(15-150 micro-molar). Inhibitors of ethylene action and synthesis, as well as ethanol did not impact tuber sprouting at physiological concentrations. Carbon dioxide at concentrations of 1 to 14 atm also inhibited tuber sprouting. Results suggest that drawdowns remain the only management tool currently available that will significantly stimulate sprouting of hydrilla tubers, particularly those in coarse (sand) substrates. Tuber formation appears to be independent of sediment redox potential, but it is hypothesized that tuber sprouting may be at least partially regulated by the redox potential in the micro-zone immediately adjacent to quiescent tubers.
Impacts: Since its introduction into waters of the United States in 1960, hydrilla is now considered the most serious aquatic weed in this country. Annual expenditures of public funds for management and in some states, eradication, costs in excess of $30 million/year. Hydrilla produces vegetative tubers, seed-like propagules which form in the hydrosoil and assure the continued survival and re-infestation of waterways following human or natural control or reduction of plant populations. A greater understanding of tuber production and sprouting will lead to more efficient management programs and significantly reduce these increasing annual expenditures.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-AGR-03667
Title: ***MOLECULAR IMPROVEMENT OF PEANUT AND SUGARCANE***
Critical Needs:
National Goals: 1
Key Themes: plant genetics; genetic engineering; peanuts; sugarcane; plant improvement; transformation; transgenic plants; plant disease resistance; virus diseases (plants); biolistics; meristems; plant embryos; mosaic (sugarcane)
Summary: Peanut is a difficult crop to genetically-engineer. Sugarcane varieties are susceptible to sugarcane mosaic virus. The purpose of this project is to develop an effective transformation system for elite peanut cultivars and to use sugarcane transformation technology to produce viral-resistant transgenics.

Progress: Three peanut cultivars, SunOleic95R, Southern Runner, and DP-1, were evaluated for tomato spotted wilt virus (TSWV) resistance. A high amount of TSWV in root crowns compared to leaves was observed for all genotypes. However, through the majority of the growing season, the more resistant genotype, DP-1, had the least infection. The field resistance manifested by DP-1 may be related to the slower accumulation of TSWV in its root crown compared to the more susceptible genotypes. This information linked with our other research on the effect of TSWV coat-protein constructs in transgenic Arabidopsis, and peanut phorate-responsive genes is leading us toward developing an effective strategy for strong TSWV resistance in peanut. We are also continuing our studies on peanut tissue culture and transformation methodologies. Regarding our sugarcane research, a total of 106 sugarcane plants were regenerated following biolistic transformation with nptII and an untranslatable form of SCMV strain E coat protein (CP) gene (Ubi-eut). Twenty accessions were selected based on superior resistance against virus infection, and analyzed in detail to provide evidence for presence and stable integration of the transgenes. Molecular analyses of the transgenic plants showed the presence of PCR-amplified 800 bp CP and 330 bp nptII gene products. Out of a total of 20 plants, 15 CP- and 13 nptII-positive plants were identified, and 13 plants were positive for both the transgenes. Southern blot analyses confirmed the transgenic nature of these plants and was used to determine integration patterns and copy numbers. These transgenic plants continue to be evaluated in the field for sustained and consistent resistance to SCMV.
Impacts: Peanuts and sugarcane will be have improved resistance to the insect-vectored viral pathogens, TSWV and SCMV, respectively. This research should result in the reduction of yield losses due to the diseases caused by these pathogens without the need for external inputs such as pesticides. This should lead to a more environmentally-friendly and economic approach to disease control in these two important agronomic crops.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-AGR-03706

Title: ***REPRODUCTIVE BIOLOGY AND GAMETOPHYTIC SELECTION IN HIGHER PLANTS***

Critical Needs:
National Goals: 1
Key Themes: plant improvement; plant reproduction; tobacco; alfalfa; tomatoes; pollen; pollen germination; sesame; corn; plant biology; plant physiology; pollen tubes; gametophytes; bioassays; reproductive efficiency; oilseeds; genetic engineering; plant genetics; quantitative genetics; plant biochemistry; plant physiology
Summary: An understanding of plant reproductive biology is essential so that the genetic influence on physiological processes can be assessed, appropriate strategies involving manipulation of genetic transmission can be developed and gametophytic systems can be adapted for pollutant assays. All aspects (pollen diameter, in vitro and in vivo pollen germination and tube growth, stigma and style biochemistry and physiology, temperature effects on these variables) of the reproductive biology on various model test species (corn, sesame, tomato) will be examined.
Progress: An understanding of plant reproductive biology is essential so that; (1) the genetic influence on physiological processes can be accurately assessed; (2) appropriate strategies involving manipulation of genetic transmission can be developed; (3) this information can be utilized in applied plant improvement programs; and (4) gametophytic systems can be used as a rapid and efficient method to assay air and water pollutants; All aspects (pollen diameter, in vitro and in vivo pollen germination and tube growth, stigma and style biochemistry and physiology, temperature effects on these variables) of the reproductive biology on various model test species (corn, sesame, tomato) have been explored in this project over the 5 years this project has been active resulting in 11 referred journal articles, 7 abstracts given at national and international symposia and the training of 3 graduate students (both at the M.S. and Ph.D. level).

Impacts: The accumulation of the information generated by reproductive biology studies conducted in this project and other national and international centers, have generated many practical applications including gametic selection for herbicide resistance (corn), selection for vigorous progeny by selection of the most competitive male gametes in genetically diverse pollen populations (corn), and selection for low temperature tolerance (tomato).
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-AGR-03726
Title: ***EVALUATION OF FORAGE GERMPLASM AND FORAGE MANAGEMENT PRACTICES***
Critical Needs:
National Goals: 1
Key Themes: forage; germplasm; forage management; pasture management; livestock; grazing management; pasture weed control
Summary: Improved warm season and cool season forages are needed for cattle production in Florida. To develop improved forage cultivars and management practices for livestock producers in Florida.
Progress: Most of the field work performed under this project has been completed. Data is being analized and reports are being written. One report on a Corn Silage Variety Test has been prepared but not published. Tropical corn varieties appear to have an advantage in terms of disease resistance compared to temperate varieties when planted late (after April 1) in peninsular Florida. Verious limpograss management studies have been completed. Publications are listed below.
Impacts: Results from these studies will help producers select the best forage varieties and management techniques for their forage production programs. This will result in more efficient production of milk and beef food products which will potentially benifit the consumer through lower prices.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-AGR-03854

Title: ***SELECTION AND ADAPTATION OF GRASS AND LEGUME SPECIES FOR FORAGE PRODUCTION IN THE SOUTHERN COASTAL PLAIN AND PENISULAR FLORIDA***

Critical Needs:
National Goals: 1
Key Themes: photoperiod; forage; setaria; paspalum; paspalum notatum; forage grasses; plant adaptation; forage production; coastal plains; plant genetics; germplasm; plant evaluation; plant breeding; plant improvement; forage yields; plant pest resistance; transgenic plants; plant response; plant accessions; plant growth; seasonal growth; clover; lolium
Summary: Winter forage production in Florida is limited by short days and cold winter temperatures which impact production of tropical forage grasses. The purpose of this project is to breed and select for tropical forage grasses which are less impacted by short days and cold winter temperatures.
Progress:. Research was completed to evaluate the effects of three levels each of colchicine, trifluralin, and oryzalin as mitotic spindle poisons in tissue culture to double the chromosome numbers of Pensacola derived bahiagrass (Paspalum notatum). Over 2000 clones produced by these treatments were planted on 90 cm centers in the field. Initial morphological evaluation of these clones showed variability for growth habit, plant diameter, and number of flowering heads. Early ploidy assessment was conducted using mitotic root tip chromosome counts. Mitotic root tip chromosome counts in bahiagrass are difficult and laborious. Therefore, alternative methods for ploidy assessment were pursued. Evaluation of leaf stomatal size was found to be a good preliminary screen for predicting putative 4x clones. Acquisition of a flow cytometry instrument in summer 2003 enabled rapid ploidy verification of putative 4x clones. This

instrument greatly reduced the amount of time necessary for ploidy verification. Over the course of this research, mitotic chromosomes counts were obtained on less than 5 clones per day, while 50 or more clones per day were analyzed using flow cytometry. Final ploidy verification was conducted using either mitotic root tip counts (167clones) or flow cytometry (256 clones). Although all treatments yielded tetraploid clones, mean percentage tetraploid individuals recovered varied among treatments(colchicine 23%, trifluralin 14%, and oryzalin 10%). At present, approximately 310 clones have been verified as tetraploid by various methods. Approximately 100 verified tetraploid clones were evaluated for response to frequent (bi-weekly) close mowing. Four replicates of each clone were planted in May in 90 cm rows with in-row spacing of 45 cm. Variability for response to mowing was observed with some clones dying by the end of summer. Final selections for clones that persist under mowing will be made in spring 2004. A second experiment evaluated response to the same mowing treatment of approximately 800 2x individuals from a segregating population. Persistence among these individuals was variable, but overall was superior to the 4x population. Research to evaluate leaf tissue tolerance to frost and freezing in bahiagrass has identified significant variability for this trait. Experiments under controlled growth chamber conditions have confirmed these differences. Preliminary research suggests that lines with higher levels of freeze damage resistance (remain green at temperatures that kill leaves of other lines) show differences in anatomical structure. Crosses are being made between freeze resistance and susceptible lines to evaluate the inheritance of this characteristic.

Impacts: Development of improved bahiagrass cultivars with cold tolerance and superior growth in late fall and early spring should enhance the profitability and sustainability of the beef cow calf industry in the SE USA.

Source of Federal Funds: Hatch

Scope: State

Project Number: FLA-AGR-03983

Title: ***CONSERVATION TILLAGE MULTIPLE CROPPING MANAGEMENT STRATEGIES FOR GREATER SUSTAINABILITY***

Critical Needs:

National Goals: 1, 4

Key Themes: non tillage; conservation tillage; multiple cropping; double cropping; triple cropping; nitrogen fertilizers; plant nutrition; soil fertility; sustainable agriculture; nematodes; corn; cotton; peanuts; hemp; winter annuals; small grains; vegetables; organic farming; urban areas; chickens; poultry manure; crop management; management systems; cropping systems; performance testing; nutrient utilization; crop yields; soil properties

Summary: Conventional tillage and monocropping contribute to erosion, loss of farmland productivity, the potential for pollution of air and streams and buildup of pests. This project examins conservation tillage multiple cropping strategies for increased utilization of farmland on a year-round basis for greater sustainability.

Progress: Proper tillage management and variety selection for peanut (Arachis hypogaea L.) is important to the survival of peanut farmers. Strip-till was compared to conventional tillage management to test 12 peanut varieties following a winter crop of rye (Secale cereale L.), at Citra, FL in 2003. Tillage was the main treatment and variety was the sub treatment in a split plot experimental design with six replications. Peanuts were all planted in 0.76 m wide rows, 4 rows wide and 10.7 m long at in-row spacing of 6 cm. Irrigation, gypsum, and other fertilizer were applied as recommended. Weeds, insects and diseases were controlled with chemicals. Disease ratings and pod yield were collected. Pod yield was not affected by tillage. Best varieties were DP-1, Andru II, and AP-3 with pod yields of 5850, 5620, and 5540 kg ha-1. These yields were almost twice the Florida state average. These high yielding varieties also had the lowest incidence of Tomato Spotted Wilt virus and Late Leaf Spot diseases. Disease ratings were lowest in strip-till treatment. These high yields also attest to the importance of our breeders who continually develop high yielding low disease incidence varieties of peanut. Variety testing of five long-juvenile

soybean lines developed by the late Dr. K. Hinson was completed in 2003. Yields of the full season planting in 2003 were essentially the same as for when planted in late August. All data illustrate the potential for significant forage production by these lines. Nitrogen content and other lab analysis will be conducted in the coming months. Depending on the line, we now have from 100 to 300 pounds of each in cold storage for future research and or potential variety release. We now have three years of data on 20 combinations of triple-cropping systems for forage. The long-juvenile soybean variety Hinson has been in the test for one of the fall planted crops. The systems have been initiated for a fourth year at present.
Impacts: Crop management studies continue to provide information to farmers on best combinations of crops and varieties to use in double and triple cropping successions and rotations. We continue to find that conservation tillage crop yields are equal or better than conventional tillage. Because of this research, present and future farmers can make better-informed choices for their economic survival and environmental benefits to society.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-AGR-04076

Title: ***DISSECTION OF TRAIT COMPONENTS AND MOLECULAR IMPROVEMENT OF GRASSES THROUGH GENETIC ENGINEERING***

Critical Needs:
National Goals: 1, 4
Key Themes: cereals; stress tolerance; risk assessment; risk management; transgenic plants; turf grasses; forage grasses; resource utilization; genetic engineering; plant genetics; traits; plant improvement; water use efficiency; plant physiology; gibberellic acid; mowing; germplasm; somaclonal variation; gene expression; biolistics; wheat; barley; rye; paspalum notatum; lolium; paspalum
Summary: Environmental limitations of forage, turfgrass and cereral production systems require advanced germplasm, that will allow the efficient use of natural resources. This project develops and applies advanced genetic transformation technology to develop grasses with improved stress response that will allow for more efficient use of natural resources. The research will also address and minimize enviromental risks associated with transgenic grasses.
Progress: 1. Develop advanced transformation protocols for grasses. Preliminary ELISA- and PCR-analysis, indicate stable expression and integration of a selectable marker gene in commercially important bahiagrass cultivars (forage type cv. T9 and Pensacola). We currently perform a Southern blot analysis with the PCR positive plants to confirm the transgenic nature of these plants. The transformation protocol based on the expression of the npt II selectable marker gene in combination with the selective agent paromomycin will provide a basis for the introduction of transgenes into commercially important bahiagrass forage type cultivars. A tissue culture protocol for the establishment of regenerable tissue cultures has been established from xeric wild barley (Hordeum spontaneum). 2. Genetic improvement by stable introduction of transgenes into grasses and evaluation of transgenic plants. We recently identified homozygous transgenic rye (Secale cereale) inbred lines that stably express one to three wheat (Triticum aestivum) high-molecular weight glutenin subunits. Transgenic rye with a prolamin to glutelin ratio similar to wheat, showed a significantly increased loaf volume compared to wildtype rye. Rye is second to wheat in bread making and rye is well adapted to environmental stress, however rye flour has a poor bread making quality compared to wheat. We were able to modulate functional properties in rye flour and improve bread making quality by introducing transgenes, which altered the quantity and quality of HMW-GS. 3. Molecular dissection of physiological traits defining the environmental limitations of subtropical forage grass production. Stress inducible regulatory sequences will be important compomnents of the engineering and dissection of environmental stress response. We isolated a barley HVA1 and an Arabidopsis rd29a promoter, which have been previously described as inducible under cold and drought

stress. Promoter-Reportergene expression cassettes were made, which will be introduced into bahiagrass and will allow to study the performance of the promoters in this heterologous system. 4. Modulate bioactive gibberellic acid content in transgenic grasses for improved turf characteristics and reduced mowing requirements. A construct that will allow the constitutive expression of a gibbelrellic acid catabolizing enzyme has been made and will be introduced into turf grass to reduce the content of bioactive gibberellic acid. 5. Risk assesment and risk management in transgenic grasses. A construct that allows the inducible expression of cell death in plant cells has been made and will be co-bombarded with a selectable marker gene into bahiagrass.
Impacts: Molecular improvement of drought tolerance and cold tolerance will enhance the productivity and persistence of commercially important cereals, turf and forage grasses and will result in a more efficient use of natural ressources. Alternatively, quality improvement in grasses and cereals that are well adapted to environmental stress can significantly increase their value.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-AGR-04083
Title: ***GENETIC IMPROVEMENT OF FORAGE GRASS AND LEGUME SPECIES***
Critical Needs:
National Goals: 1
Key Themes: forage grasses; forage legumes; pest resistance; biotechnology; clover; alfalfa; forage; festuca arundinacea; fabaceae; plant genetics; biodiversity; forage quality; forage yields; new technology; tissue culture; plant breeding; forage persistence; recurrent selection; root knot nematodes; plant nematode resistance; germplasm; economic efficiency; pastures; agricultural economics
Summary: Many forage crops do not perform well in Florida due to damage caused by pests or because they are not adapted to the environmental conditions. This project will attempt to identify genetically superior individuals and to create new populations that will offer more and better choices of forage crops for use in the animal industry.
Progress: A white clover population selected for root-knot nematode tolerance was subjected to a greenhouse study evaluating growth characteristics. Compared to the original source population, the selections had significantly more top growth, root growth, less gall formation, less egg mass formation, and less plant mortality. This population will be evaluated for response to other isolates of the pathogen. A study investigating the inheritance of promisuous nodulation in soybean was successful in identifying the number of loci and the mode of gene action controlling the trait. Several selection criteria were evaluated for use in the subsequent transfer of the trait and from this group some were identified as being useful in the incorporation of the trait into other germplasm. An experimental diploid red clover population FLMR7 was developed and released in 2002 and foundation seed was produced in 2003. A tetraploid red clover (T. pratense) population was produced, has undergone three cycles of selection, and breeder seed is currently being increased in Oregon. Primary selection criteria were seedling vigor, adaptation to Florida conditions, and improved seed production. A mid-dormant diploid red clover was developed by four cycles of recurrent phenotypic selection and a breeder seed increase is currently underway. Field evaluation at Gainesville of a segregating population of Lotononis bainesii developed by a Uruguayan cooperator showed potential for use as a forage legume. However, reliance on native rhizobia resulted in ineffective nodulation with poor growth and persistence. A subsequent experiment in 2003 using effective rhizobium, resulted in vigorous growth during the summer and fall, but questions regarding winter persistence remain. Thirty plant introductions of pintoi perennial peanut (A. pintoi) have been evaluated for morphological and molecular variability. Agronomic performance of these accessions grown on a flatwoods soil at Gainesville, FL suggests large variability for forage and seed yields, but a general lack of adaptation to north central Florida.
Impacts: The development of cultivars for these species will have a direct effect on stand productivity and longevity, both of which will be economically beneficial to producers.

Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ANS-03659

Title: ***METABOLIC RELATIONSHIPS IN SUPPLY OF NUTRIENTS FOR LACTATINGCOWS***

Critical Needs:
National Goals: 1
Key Themes: animal nutrition; animal metabolism; dairy cows; lactation; nutrient availability; protein sources; energy sources; milk protein; animal performance; nitrogen utilization; feed composition; dietary carbohydrates; dietary fibers; feed supplements; fermentation products
Summary: Experiments will evaluate the effect on animal performance and nitrogen utilization of substituting neutral detergent-soluble fiber for starch in the rations of lactating dairy cows. Future experimennts will include evaluation of different sources of carbohydrate supplementation on efficiency of nitrogen utilization, animal performance, and variation in fermentation products available for the animal's use.
Progress: In the interest of better characterizing metabolizable nutrient supply to animals, the following research efforts were accomplished: Development and delivery of a nutritionally relevant analysis system for partitioning of non-neutral detergent fiber carbohydrates (NFC). Demonstration through in vitro fermentations and an animal feeding study that the classes of NFC differ in the metabolizable nutrients that they supply and that this can alter lactation performance. Demonstration in vitro that sucrose can increase the rate of fiber digestion. Demonstration that pH and protein source can alter the yield of microbial protein from sucrose fermentations in vitro. Demonstration that cottonseed hulls can alter intake and rate of passage, and accordingly, nutrient flow in dairy cattle. Overall, the research and extension program devoted to this project offered information for nutritionists on the content of NFC in feedstuffs and a start on a system to determine appropriate proportions of the various NFC fractions to feed to maintain animal performance and health.
Impacts: The carbohydrate analysis system we developed is currently in use by commercial feed analysis laboratories for use by nutritionists in the field. It is also in use in university research laboratories. Used in combination with the information developed on animal use of the different carbohydrates, it allows a more objective method for diet formulation to enhance animal performance, health, feed efficiency, and potentially decreased nutrient excretion.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ANS-03818

Title: ***IMPROVEMENT OF BEEF CATTLE IN MULTIBREED POPULATIONS: PHASE III***

Critical Needs:
National Goals: 1
Key Themes: beef cattle; animal breeding; cattle breeds; animal genetics; predictive models; crossbreeding; mating; covariance; genetic variance; statistical models; quality evaluation; algorithms; traits; population genetics; selection systems; combining ability; simulation models; computer programs
Summary: Prediction of genetic values of purebred and crossbred animals in multibreed populations. Estimation of genetic variation and combining ability of animals in multibreed populations. Devise new and more precise genetic-statistical models to predict the genetic values of animals and their combining ability in populations of animals composed of purebred and crossbred animals.

Progress: Research work during this period covered: 1) acquisition, collection, editing, and genetic statistical analysis of national and international experimental and field beef and dairy multibreed data sets, 2) unibreed and multibreed genetic evaluation and estimation of additive and nonadditive covariance components in dairy and beef multibreed data sets from various countries, 3) development of a long-term research collaboration with Thai researchers for the genetic evaluation of beef and dairy cattle in upgraded multibreed populations, 4) continuation of the development of dedicated software for editing multibreed data sets, finding connected sets, and evaluating animals for additive and nonadditive genetic effects in USA, Chilean, and Thai multibreed cattle populations, with emphasis on upgraded multibreed populations composed of more than two base breeds, 5) development of software for editing and integrating reproduction, survival, growth, and carcass data from multibreed datasets, and finding connected datasets for subsequent genetic statistical analysis, and 6) genetic analysis of scrotal circumference in Nellore sires and its relationship to growth traits in their progeny in collaboration with Brazilian scientists. Multibreed data continued to be collected in USA, Colombia, and Thailand. Collaboration with Thai researchers covered educational, and research and development aspects in multibreed genetic evaluation of animals in dairy and beef cattle populations. Research and development efforts addressed data aspects (collection, editing, and management), mating plans, variance components estimation, genetic evaluation, and genetic trends. Educational aspects included training and dissemination of information to cattle producers, industry representatives, government officials, and researchers. This collaboration produced seven presentations, and nine publications including a Thai Sire and Dam Summary. Collaboration with Chilean researchers resulted in one presentation and two publications. Research emphasized estimation of covariance components for multibreed additive and nonadditive genetic effects and multibreed genetic trends in the Chilean Holstein-Other cattle population. Heritabilities were moderate for all traits in Holstein, Other, and Holstein x Other crossbred groups. Interbreed interactibilities (ratio of nonadditive genetic to phenotypic variances) were all near zero. Multibreed additive, nonadditive, and total genetic trends were estimated using the complete dataset (56,277 cows). Upward trends between 1990 and 2000 existed for all traits, genetic effects, and breed groups, except for 305-d ME protein yield in 25% Holstein, indicating that Chilean dairymen were successful in choosing progressively better semen and sires from imported and local sources over time. Collaboration with Brazilian researchers began in 2003. Research was on genetic variability and selection for scrotal circumference in Nellore sires and its relationship to growth in their progeny.
Impacts: This research had both national and international impact. Research and development collaborations with scientists from Brazil, Chile, Colombia, and Thailand contributed with information applicable to multibreed populations in any country with similar environmental conditions. The Chilean multibreed field dataset permitted the development and testing of software for the evaluation of animals for dairy traits in small and medium sized multibreed populations. Researchers in Colombia and Thailand continued to work with cattle producers and industry people to gather field data for yearly estimations of genetic variation and of prediction of genetic values of animals for economically important traits.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ANS-03821

Title: ***SYNCHRONIZATION OF ESTRUS IN CATTLE OF BOS INDICUS BREEDING***

Critical Needs:
National Goals: 1
Key Themes: prostaglandins; progesterone; artificial insemination; beef cattle; estrus; synchronization; animal breeding; anestrus; animal physiology; reproductive performance; livestock production; performance evaluation; lactation; post partum; heifers; production systems; systems development;

regional research; tropical agriculture; beef cows; gonadotropin releasing hormone; growth factors; comparative analysis; field trials; estradiol; timing; pregnancy rate

Summary: Cattle that have some Bos indicus breeding are less resposive to estrus synchronization products than cattle of Bos taurus breeding and therefore have a decreased reproductive efficiency to estrosu synchronization programs. This project will evaluate different combinations of estrous synchronization products in cattle of Bos indicus breeding to enhance the success rate of AI and eventaul development of a timed-AI protocol.

Progress: The objective of all our estrous synchronization research is to develop an effective estrous synchronization experiment in cattle of Bos indicus x Bos tuarus breeding that consistently yields an acceptable AI pregnancy rate (greater than 50%) while using the drugs that are currently available to beef cattle producers and approved for use by the Food and Drug Administration (FDA). We conducted a 2x2 factorial estrous synchronization experiment in postpartum lactating Bos indicus x Bos Taurus cows and Bos taurus cows. Tested the main effect of GnRH vs. no-GnRH at the insertion of a 7 day controlled intravaginal releasing device (CIDR) to improve pregnancy rates to a AI breeding 7 days later. At CIDR removal all cows received prostaglandin on day 7. There were two AI protocols 1) cows AI for 3 days after a detected heat with all cows not showing heat by 72 hours were timed-AI with GnRH (AI+GnRH) 2) cows received estradiol cypionate (ECP) 24 hours after CIDR removal and cows were AI after an observed estrus and all cows not showing estrus by 72 hours after CIDR removal were timed-AI at such time (ECP). The pregnancy rates for Bos indicus X Bos taurus cows for the four treatments were 1) GnRH+CIDR with AI +GnRH - 59.7% 2) No GnRH+CIDR with AI +GnRH - 40.3% 3) GnRH+CIDR with ECP - 53.1% 4) No GnRH+CIDR with ECP - 44.4%. The pregnancy rates for the Bos taurus cows for the four treatments were 1) GnRH+CIDR with AI +GnRH - 66.7%; 2) No GnRH+CIDR with AI +GnRH - 53.3% 3) GnRH+CIDR with ECP - 44.9% 4) No GnRH+CIDR with ECP - 66.4%. Providing GnRH at CIDR insertion increased ($P < 0.05$) overall pregnancy rates by 14% in the Bos indicus x Bos taurus cows compared to the CIDR alone but had no added benefit in the Bos taurus cows. Combing three days of estrus detection with a timed-AI was the most consistent synchronization protocol in either breed of cows. It resulted in a 60% AI pregnancy rate in the Bos indicus x Bos taurus cows and 66.7% in the Bos taurus cows.

Impacts: This research has very important implications for beef producers in Florida as well as other beef producer synchronizing estrus in Bos indicus x Bos taurus cattle. First, producers must use GnRH at the initiation of a CIDR treatment to attain acceptable results. If they do not use GnRH at the insertion of a CIDR, AI pregnancy rates could be decreased by 10 to 15%. Second, this is also important because it provides producers with an effective estrous synchronization system that utilizes drugs that have been approved by the FDA for use in food producing animals with no withdrawal time.

Source of Federal Funds: Hatch

Scope: State

Project Number: FLA-ANS-03859

Title: ***USE OF BST, SHORTENING THE DRY PERIOD, AND PREPARTUM FEEDING OF ANIONIC SALTS TO IMPROVE MILK PRODUCTION AND HEALTH OF DAIRY COWS.***

Critical Needs:

National Goals: 1

Key Themes: dairy cows; lactation; feed intake; somatotropic hormones; animal health; animal hormones; metabolites; dry cows; estrogens; milk composition; pre partum; body weight; diet; body condition; anions; cations; dairy cattle; nutrient utilization; animal physiology; livestock management; animal nutrition; dosage; biological activity; growth factors; blood levels; plasma levels; field trials; reproductive performance; post partum; estradiol; animal metabolism

Summary: Management practices, diets fed and shortened dry periods are being evaluated in dairy cows. The purpose of this study is to examine the effectiveness of available technology, feeding management, and short dry periods to improve the feed intake of dairy cows around calving. The purpose is to improve their intake of feed, reduce their health problems and allow high milk production after calving. The project also examines whether we can speed-up the dry-off of mammary tissue by using estrogen at the time of dry-off and thereby reduce the standard 60-day dry period in half.
Progress: The final bST experiment was intitited and completed. Major objectives were to evaluate effects of biweekly injections of low doses of bST (0.4 mL of POSILAC, 10.2 mg/d) on plasma concentrations of somatotropin (ST), insulin (INS) and calcium (Ca), and calving variables and milk yield (MY). This experiment was a larger field-trial using multiparous Holstein cows (n=103) assigned randomly to a 2x2 factorial arrangement of treatments (TRT; I=no bST, n=26; II= bST postpartum, n=25; III=bST prepartum, n=27; IV=bST prepartum and postpartum, n=25). Prepartum injections began 3 wk before expected calving through calving and postpartum injections were from calving through 28 DIM. Cows injected prepartum or postpartum or during both periods had greater mean daily MY than controls (33.50, 34.50, 37.55 vs. 29.68 kg; P<0.01). No TRT effects were detected on mean body weight (BW, P=0.62) or body condition score (BCS, P=0.42) prepartum or at calving. No TRT effects were detected on mean calf birth weight (P=0.61). Prepartum injections of bST increased ST concentrations during the prepartum period (~6%), and in cows injected postpartum ST concentrations were higher only after 3 wk postpartum (~35%). No TRT effects were detected on INS or Ca concentrations throughout the experimental period. Injecting bST during the transition period positively impacted ST concentrations and increased MY, with no apparent adverse effects at calving or on cow or calf health. Collection of milk yield data, and liver and blood plasma analyses are continuing. The fourth experiment previously described was completed. Multiparous Holstein cows were used to evaluate glucogenic supplements added to daily TMR. Treatments were 1)control, none, n=29; 2) NutroCal (Kemin Americas), 0.114 kg/d, n=33; 3) Metaxerol (Pestell America), 0.454 kg/d, n=31; and 4) propylene glycol, 0.300 kg/d, n=31. Closeup dry TMR was fed through day of calving then fresh cow TMR was fed through 100 DIM, but supplements were discontinued after d 28. Prepartum feed intake (kg/d) at wk -3 (28.85), wk -2 (31.91) and wk -1 (28.89) did not differ due to TRT. Feed intake decreased 17.8-30.9% the week before calving, greatest decrease was during the 2 d before calving. Postpartum feed intake increased in all TRT groups during each of the 4 wk and no differences in intake were detected due to TRT except during wk 4 (1>2; 39.18 vs 36.50, P= 0.0608) and (3>2; 39.05 vs. 36.50, P=0.0698). MY for TRT groups did not differ during the first 4 wk when supplements were fed except that cows in TRT 4 produced less milk (~2.5 kg/d; P=0.0356). Overall, 3.4 kg/d less milk was produced during hot season. MY did not differ due to TRT for 28-70 (P=0.7127) or 4-100 DIM (P=0.9072) and no TRT comparisons were significant. BCS and BW prepartum and postpartum did not differ due to TRT. Overall, cows in all groups had similar MY, maintained BW and BCS equally well, and had similar patterns of feed intake during prepartum and postpartum periods. Analyses of blood plasma samples and liver samples, and their association to milk production are in progress.
Impacts: The occurrence of several different metabolic diseases is greater during the transition period than at any other time during the lactation cycle of the dairy cow. Higher incidences of these diseases seems to be associated with reduced feed intake and greater energy deficit during the late prepartum and early postpartum periods. The sudden start of milk production after calving places a great strain on the metabolism of the cow as she tries to support the function of the the mammary gland. This strain is exacerbated if feed intake is reduced before calving and/or is too slow to increase after calving. This often leads to a shortage of available glucose and other metabolites that are needed to support milk synthesis which then results in too great a mobilization of lipids and their storage in the liver. Our goals have been to define the extent of this problem and then to evaluate ways to limit the extent of feed reduction and liver lipid accumulation and to increase the availabiltiy of glucose if there is reduced feed intake. We have done this by using low doses of bST to improve feed intake and body metabolism and to supply additional glucogenic precursors to offest this limitation. These strategies have been used jointly and singly to evaluate the best practices to implement as a way to improve transiton period feed intake and

metabolism. We have limited our research to those strategies that could be implemted on commercial dairy farms.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ANS-03980

Title: ***IMPROVING EFFICIENCIES OF IN VITRO EMBRYO PRODUCTION TECHNOLOGIES IN CATTLE.***

Critical Needs:
National Goals: 1
Key Themes: embryo culture; beef cattle; in vitro; dairy cattle; reproductive performance; livestock production; cell biology; molecular biology; embryo development; production efficiency; production systems; speed; viability; insulin like growth factors; embryo survival; performance evaluation; genetic markers; biochemistry; prediction; environmental factors; gene expression; animal genetics
Summary: Advanced in vitro embryo technologies are still quite inefficient due to associated problems with early embryonic loss, large offspring syndrome, and postnatal mortality . The purpose of this project is twofold: 1) to devise rapid methods for assessing viability in preimplantation bovine embryos for increased survival; and 2) determine how in vitro culture conditions effect the expression of Insulin-like Growth Factor (IGF) family members.
Progress: Maintenance of recipient cows is the most expensive component of embryo transfer, especially if the fetus is lost late in gestation. Improving our ability to select embryos that are genetically normal will increase chances of survival to term and decrease costs associated with maintaining open recipients. This will make the newer reproductive technologies, such as embryo transfer, in vitro embryo production, cloning, and genetic selection more economically feasible for cattle producers. One of the goals of this project was to develop genetic tests for pre-screening cattle embryos prior to transfer, allowing us to quickly eliminate genetically abnormal embryos and even select for embryos with beneficial traits. We have made substantial progress towards completing the first objective, which was to optimize embryo biopsy and fusion techniques for producing metaphase spreads for genetic analysis. To do this we now use a piezo injection procedure that bypasses the fusion process, making this a much more efficient process. Addtionally, we are working on chemical means for inducing chromosome condensation for improving efficiencies for these tests. The second objective to develop karyotyping and FISH procedures is still in progress. To further enhance progress on this project, a University of Florida Opportunity Grant was also obtained which will expand our interests to include use of genetic screening in equine embryos. Two graduate students are now working on these and related projects to further the progress of this research. Another aspect of this project has been comparing gene expression of the insulin like growth factor (IGF)family members in cloned embryos versus in vivo and in vitro produced embryos as a means to determine possible causes of large offspring syndrome (LOS). We have determined that gene expression of these growth factors is aberrant as early as day 25 of gestation in cloned embryos and this information has been published in abstract form and a manuscript has been submitted for publication in a peer reviewed journal. Since the start of this project however, it has now been shown that expression of many genes are altered in clones and we are now pursuing possible mechanisms for this global effect. An NRI proposal has been submitted to help fund this research.
Impacts: Methods that improve embryo survival and enhance our ability to assess the embryo's ability to survive will greatly increase efficiencies of the artificial reproductive technologies, namely cloning and in vitro embryo production. Improved efficiencies will reduce costs, making these technologies more feasible for use by cattle producers and allow for increased production of genetically superior animals.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ANS-04111

Title: ***INFLUENCE OF NUTRITION AND MANAGEMENT ON SKELETAL DEVELOPMENT OF GROWING HORSES***

Critical Needs:
National Goals: 1
Key Themes: horses; animal growth; skeleton; nutrient requirements; exercise; animal physiology; animal nutrition; livestock management; bone development; bones; nutrient utilization; gestation; maternal influence; mares; nutrient intake; foals; lactation; nutrient interrelations; energy intake; diet; milk composition; weight gains; bone mineralization; dietary fatty acids; mineral nutrition; dietary amino acids
Summary: The longevity and soundness of the equine athletic is dependent upon the soundness of the skeletal system. Problems with skeletal development are documented to occur early in life (3 mo.) and may progress or regress. Nutrition of the mare and the suckling foal are therefore critical to the process and form the foundation for future development of the animal. More information is needed on the key nutrient needs of the developing horse. This project assesses the nutrient requirements of the mare and growing foal for optimal skeletal development of the young horse.
Progress: Twenty -four weanlings were used in a feeding trial to evaluate the effect of fatty acids on growth and skeletal development. All of the weanlings were fed a concentrate to appetite plus 1.0% BW of C. bermudagrass hay. Half of the weanlings received corn oil at a rate of 5% of their concentrate while the other half received a mixture of corn oil and linseed oil. The mixture will have a n-6:n-3 ratio of about 2 while the other diet provided a ratio of about 50. The weanlings were housed in drylot paddocks. Half of each diet group will be exercised on a free walker four days per week. this experiment is still under way.
Impacts: This experiment will provide information on the influence of fatty acids on bone development in growing horses and could influence which fat sources are to be recommended to maximize bone growth.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-APO-03523

Title: ***MANAGEMENT OF DISEASES OF TROPICAL FOLIAGE PLANTS***

Critical Needs:
National Goals: 1
Key Themes: plant diseases; tropical plants; foliage plants; plant disease control; pathogen identification; bacterial diseases (plants); ornamental plants; fungus diseases (plants); microbial ecology; plant pathogens; chemical control (diseases); plant disease resistance; biological control (diseases); resistant varieties
Summary: Significant yield losses caused by plant pathogens are common in the ornamental foliage and bedding plant industries. The purpose of this project is first to identify and describe the diseases limiting production. Secondly, to develop chemical, nonchemical and integrated methods for control of foliage and bedding plant diseases. Subsequently, to disseminate this information on diseases and their management to extension personal and to growers.
Progress: Since the inception of this project, research has been conducted for the ornamental plant industry on biological control, plant resistance, pesticide efficacy tests, international regulatory issues regarding pathogen movement, and taxonomy of fungal and bacterial pathogens. The following are

specific accomplishments under this project: 1) Discovered and described a new Xanthomonas disease on ornamental Asparagus ferns using classical, molecular, and biochemical techniques. 2) Compared 588 strains of three closely related species of Xanthomonas and Stenotrophomonas (Xanthomonas) maltophilia using cellular fatty acid analyses. 3) Discovered and described a distinct subpopulation of Ralstonia (Pseudomonas) solanacearum (Race 1, Biovar 1); which is entering Florida from Costa Rica in infected ornamental propagative stock. 4) Using internal growth rates in plants, metabolic fingerprinting, pulse-field RFLP, and fatty acid composition described the Xanthomonas pathovar hederae, which infects English ivy and closely related species. 5) Conducted research on a morphological and genomic comparison of isolates of Cylindrocladium from spathiphyllum and leatherleaf fern. 6) Studied the ecology of Colletotrichium acutatium, the causal agent of anthracnose on leatherleaf fern. 7) Conducted research on the use of biological control of Rhizoctonia root rot of flowering and bedding plants using species of Bacillus. 8) Examined twenty of the most popular cultivars of Dieffenbachia for resistance to Xanthomonas campestris pv. dieffenbachiae, Erwinia chrysanthemi, Fusarium solani, and Myrothecium roridum. 9) Looked for resistance in potted anthurium cultivars to anthurium blight caused by Xanthomonas campestris pv. dieffenbachiae. 9) Examined cultivars of Spathiphyllum plants for resistance to Cylindrocladium root rot. 10) Worked with growers to determine if recycled water was promoting Erwinia soft-rot outbreaks in nurseries.
Impacts: The ornamental industry in Florida has a wholesale value of over $1.7 billion. Research conducted in this project on pathogen epidemiology and movements, taxonomic differences within pathogens, and host resistance; make it possible to give sound recommendations on disease control. Thus, this research directly affects productivity of the State's horticultural industry.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-APO-03609
Title: ***INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS***
Critical Needs:
National Goals: 1
Key Themes: ornamental plants; floriculture; plant evaluation; plant introductions; foliage plants; woody ornamentals; plant collection; nursery stock; information collection; plant breeding; new varieties; experimental design; data bases; plant adaptation; screening systems; plant genetics; genetic stocks
Summary: The ornmental industry in continually in need of new plant materials to expand their markets. This project examines growth and performance of new plants that may have commercial ornamental potential.
Progress: Accessions of Epipremnum and Monstera are being evaluated for desireable horticultural characteristics and for breeding potential. We are also evaluating Barleria and Ruellia species and cultivars for breeding potential. Our long range goal is to develop new interspecific hybrid cultivars that are sterile.
Impacts: New germplasm evaluation is important to the continued improvement of any crop. It is essential for finding new genetic sources of insect or disease resistance that can then be incorporated into new cultivars.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-APO-03875

Title: ***DEVELOPMENT OF NEW POTATO CLONES FOR ENVIRONMENTAL AND ECONOMICAL SUSTAINABILITY IN THE NORTHEAST***

Critical Needs:
National Goals: 1
Key Themes: potatoes; climate; late blight (potatoes); bacterial wilt (potatoes); brown rot; nutrient management; plant biology; plant genetics; clones; new varieties; environmental factors; sustainable agriculture; heritability; traits; plant improvement; tetraploids; plant pest resistance; plant evaluation; early maturity; cold storage; cultural practices
Summary: Cultivars and new seedlings will be evaluated in replicated trials for horticultural performance and disease resistance.
Progress: Terminated 09/30/2002
Impacts: Over 630 potato lines and varieties were evaluated for characteristics to improve quality and yield under Florida growing conditions. Two lines have been identified for release which should provide market advantages fot processing and fresh market sales.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-APO-04012

Title: ***BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES***

Critical Needs:
National Goals: 1, 4
Key Themes: integrated pest management; vegetables; biological control (insects); insecticides; insecticide resistance; insect control; brassica; plutella xylostella; aphididae; bemisia; trichoplusia ni; leaf miners; insect biology; management systems; systems development; crop production; economic injury threshold; non target organisms; natural enemies; fertilizers; production systems; cultural practices; host range; insect population; population census; sampling; distribution; decision making; crop yields; predictive models
Summary: Insecticide resistance, losses of registrations, effects on the environment, and safety issues have presented a need for alternatives to insecticides in the management of insect pests of vegetables The purpose of this project is to address problems in the management of insect pests in vegetable crops, principally cole crops such as head cabbage and collards. Emphasis is placed on the use of insecticides and alternatives to insecticides in the management of diamondback moth, cabbage looper, aphids, whiteflies, and dipterous leafminers.
Progress: Laboratory and field experiments to determine the effects of a two-species host system on species-specific parasitism by Trichogramma were completed. Farmer interviews were completed in Puerto Rico to collect information to be used to characterize the local farming systems and vegetable-growing practices with a focus on cabbage production and the integration of biological control with egg parasitoids.
Impacts: The results of this work will contribute to the acceptance of biological control as a management tool for caterpillar pests of cabbage on small-scale farms, which, in turn, will contribute to a reduction in the use of insecticides and an increase in the sustainability of cabbage production.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-BGL-03711
Title: ***TURFGRASS FERTILITY MANAGEMENT AND ENVIRONMENTAL IMPACT***
Critical Needs:

National Goals: 4
Key Themes: turfgrass; fertilization; lawn; runoff; leaching; nitrogen; phosphorus; football;
Summary: Nitrogen and phosphorus fertilization are essential for production of attractive, healthy turfgrasses in south Florida. However, the fertilization must be conducted in such a manner as to minimize nitrogen and phosphorus losses in runoff waters. The project is designed to identify fertilization techniques that minimize nitrogen and phosphorus losses in runoff waters from golf and home lawn turfgrass, and to identify fertilization and other practices that promote stable, well-covered, and attractive football fields.
Progress: Sodium (Na) is an essential element for bermudagrass (Cynodon sp.), and for certain other warm-season (C4) plants. It can substitute for potassium (K), and K deficiency symptoms of many plants are reduced, not increased, by Na. Turf managers in Florida often express concern about the effect of Na on turfgrass potassium (K) nutrition. The study was conducted to gain information on the role of Na on turfgrass growth and quality on a sand soil. Tifway bermudagrass on native sand soil was fertilized beginning August, 2001, with nitrogen at the rate of 10 g m-2 month-1 and with various combinations of K and Na ranging from 0 to 5 g m-2 month-1 of K, and up to the same molar equivalent of Na (i.e., up to 3 g Na m-2 month-1), applied monthly as KCl or NaCl, for the purpose of assessing the effect of Na on turfgrass performance. A wide range of soil-test K values were obtained in response to K fertilization. Soil-test Na, however, was only minimally affected by Na fertilization. In spite of the wide range in soil test K observed, no significant differences in clipping weights or in visual ratings were observed in the first year. Such differences were observed at times in the second year. In the absence of K or Na fertilization, the lowest rating and clipping weight were observed, and the highest values for both were observed with the highest rate of K fertilization. Sodium fertilization did not significantly reduce ratings or clipping weights at any level of K fertilization. To the contrary, at times in the absence of K fertilization Na fertilization increased clipping weight. In both 2002 and 2003, tissue Na was greater in the complete absence of K fertilization than at any level of K fertilization greater than zero. If any K fertilizer was applied at all, tissue Na decreased significantly. Furthermore, tissue Na was unaffected by Na fertilization. Even the absence of K fertilization, tissue Na was not increased by Na fertilization.
Impacts: Turf managers may not be unnecessarily concerned about sodium, or fertilize excessively with potassium.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-BGL-04012
Title: ***BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES***
Critical Needs:
National Goals: 1, 4
Key Themes: vegetables; insect control; integrated pest management; plant insect resistance; insecticides; spodoptera frugiperda; euxesta stigmatias; elasmopalpus lignosellus; liriomyza trifolii; diabrotica balteata; leaf miners; aphididae; insect biology; elateridae; sweetcorn; beans; brassica; natural enemies; monitoring; insect population; crop damage; environmental impact; crop production; thrips; insect reproduction; insect growth; insect development; insect behavior; insect traps; cultural practices
Summary: Vegetable crops are major Florida agricultural commodities (e.g., $1.3 billion estimated value, 1999-2000) which are attacked by a large complex of arthropod pests. Research on many of these arthropods is required to foster our understanding of their complex biologies and behaviors and to facilitate the development of environmentally and economically acceptable control strategies.
Progress: Completed two field trials in which less toxic and more target-specific newly labeled and experimental insecticides performed as well or better than older more environmentally toxic products. This information is important to growers and environmental concerns growing sweet corn in the Everglades Agricultural Area of south Florida to reduce use of the more toxic insecticides while still maintaining profits. Evaluations of labeled insecticides against adult Euxesta stigmatias, 'corn silk fly',

revealed large differences in both contact and residual activity. These results allow growers to make better decisions on purchase and application of available products. Recovery from exposure to low dosage rates of pyrethroid insecticides also indicate the potential for development of resistance to the most effective materials available to the growers. Corn silage acreage is increasing in Florida and growers need information on the best way to use advancements such as Bt-enhanced subtropical-adapted cultivars. Evaluations of various Insect Resistance Management Stewardship Plans for growing Bt-enhanced silage corn in Florida (part of the southern cotton growing region) found that interplanting of multiple-row blocks of standard and enhanced corns within the same field can lead to higher levels of damage by Fall armyworms to both corns. This may result in growers spending additional funds to treat corn acreage for armyworms that would otherwise not require treatment. Completed evaluation of F2, F3 and many F4 crosses of insect resistant cos (romaine) lettuce as part of larger goal to produce isogenic lines of resistant cultivars for biochemical testing to determine resistance mechanism.
Impacts: Research on corn insect pest management will allow growers to better select the insecticide products suited to their pest situation and yield expectation. Confusion within the silage corn industry regarding the IRM Stewardship Plan requirement (i.e., 50% or less acreage in Bt-enhanced silage corn) accentuates the need for this and further research to help the growers adapt to using the new subtropical adapted insect resistant corns. Breeding and insect resistance evaluations in romaine lettuce have nearly succeeded in developing varieties genetically pure for the resistance genes. Such a result will allow biochemical evaluations to determine the chemicals responsible for the insect resistance and development of tests to more rapidly screen plants for resistant characteristics.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-BRA-03609
Title: ***INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS***
Critical Needs:
National Goals: 1
Key Themes: ornamental plants; floriculture; plant breeding; plant genetics; plant introductions; plant evaluation; genetic stocks; plant collection; screening systems; new varieties; information; information dissemination; data collection; annual plants; perennial plants; grasses; foliage plants
Summary: A. New plant materials need to be evaluated for their floricultural use. B. Genetic diversity needs to be incorporated into existing floricultural crops. A. This project will collect and evaluate new plants and make preliminary crosses to increase the availability of new floricultural crops. B. Plant production management systems will be initiated for each new plant cultivar.
Progress: Florida producers of cut flowers and flowering pot plants require a continuous flow of new cultivars in order to maintain current markets and to expand production/sales. New cultivars may be advanced breeding selections of crops currently under production or newly introduced novel crops, that are adaptable to Florida growing conditions, climate, and that are resistant to crop pests. 1) A caladium breeding program emphasizing bright colorful leaves, multiple leaf development, and large, good quality tubers was established in 1976. Hybridizations among commercial caladium cultivars and their subsequent culture and selection on muck and sandy soils have resulted in the release of 11 new cultivars with the first release in 1988. The cultivar Florida Moonlight (a large-white fancy leaved caladium) was released to the industry in 2002. This cultivar prefers partial to full shade conditions in the landscape, and makes an excellent potted plant when tubers are de-eyed for production in 10 to 15 cm pots. Seven advanced breeding lines were increased for potential release within the next three years. F1 seedlings were produced from parents with known fusarium resistance. After preliminary screening, over 50 lines of the 1500 seedlings are being subjected to macro-propagation for further screening due to little or no tuber rot observed in inoculated tubers. 2)A lisianthus selection and breeding program was begun in 1985 with the goal of developing heat-tolerant, basal branching, bedding (dwarf) and pot plant (semi-dwarf) cultivars. Maurine Blue and Florida Blue lisianthus cultivars were released in 1995, and by 2002 there

have been nine pot types in the Maurine series and four dwarf bedding types in the Florida series. They have been developed as the first heat-tolerant cultivars whose seedlings can be grown at 28 to 31C without rosetting making them highly desirable for production in Florida. Two dwarf bedding plant selections are being evaluated for release in the Florida series. They have bicolored flowers, white with a dark purple or pink rim. They should be released in 2003 as the first bi-color, heat-tolerant, bedding plant lisianthus. They are day neutral, allowing production year-round in Florida. Current research is for double flowering pot and bedding plant types, and a new cut flower program was initiated for fall flowering, heat-tolerant tall cultivars of lisianthus. 3)A comprehensive program for evaluating seed propagated bedding plants was initiated in 1984 and expanded in 2000 to include fully replicated cultivar evaluations with and without pest management. Over three hundred cultivars were evaluated that included Impatiens, Tagetes, Pansy, Viola, Petunia, Pelargonium, Ageratum, Begonia, Celosia, Pentas, Dianthus, Eustoma, Nicotiana, Gazania, Antirrhinum, Helianthus and other miscellaneous annual seeded bedding plants. 4) Eleven Trachelium cultivars were evaluated for cut flower production in Florida. New genetics provided significant improvements over older cultivars.
Impacts: Determining the performance of floricultural crops under Central Florida conditions provides valuable information for crop selection and production of these crops by growers, as well as aiding decisions for use of selected varieties by landscapers and homeowners. Breeding efforts are also enhanced with the potential to develop new varieties with improved performance.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-BRA-03764

Title: ***STRAWBERRY CULTIVAR DEVELOPMENT***

Critical Needs:
National Goals: 1, 4
Key Themes: tetranychus urticae; tetranychidae; plant insect resistance; strawberries; integrated pest management; insect control; cultivars; plant improvement; leaf area; plant response; leaf color; reproduction; egg counts; viability
Summary: Susceptibility to twospotted spider mite is one of the most serious problems facing the west central Florida strawberry industry. The purpose of this project is to develop cultivars that are tolerant to twospotted spider mite.
Progress: Programs of acequinocyl, bifenazate, CX-7020, CX-7026, etoxazole, fenpyroximate, hexythiazox, and milbemectin alone and in combinations with other miticides were compared to a program of abamectin and to an untreated check in strawberry. All programs except that of CX-7020 provided good control of twospotted spider mite. The not yet registered acequinocyl, CX-7026, etoxazole, fenpyroximate, and milbemectin may add to diversity of modes of action. In other experiments on strawberry, experimental acequinocyl and bifenazate provided effective control of spider mites compared to grower standards. Coleomegilla maculata performed better as a biological control agent for melon aphids and twospotted spider mites on strawberry than did Geocoris punctipes or Orius insidiosus. Third instar larvae of C. maculata performed better than did other larval instars or adults. Phytoseiulus persimilis performed well as a biological control agent for twospotted spider mite in strawberry when applied at one predator per four plants and using and abbreviated program of fenbutatin-oxide miticide.
Impacts: Florida produces about $170 million value of strawberries each year. Twospotted spider mites and other arthropods always are economic pests and in many years are a limiting factor for economic production. This research will provide strawberry producers with chemical and biological means to reduce losses and increase the stability of the Florida strawberry industry.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-BRA-04012

Title: ***BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES***

Critical Needs:
National Goals: 1, 4
Key Themes: integrated pest management; insect control; vegetables; biological control (insects); plant insect resistance; cultural control (insects); chemical control (insects); anthonomus eugenii; bemisia argentifolii; bemisia tabaci; thrips; plutella xylostella; leaf miners; elateridae; aphididae; tomatoes; peppers; estimation; crop damage; insect population; crop production; insect ecology; quantitative analysis; oviposition; insect development; predation; economic injury threshold; mites; diptera; keiferia lycopersicella

Summary: Vegetables are major agricultural commodities produced in Florida that are attacked by many arthropod pests including whiteflies, weevils, lepidopterous larvae, flies, wireworms, aphids and mites with losses ranging from about 25 to 100 percent. The purpose of this project is to develop appropriate management tactics that are practical, economical, environmentally sound, and commercially acceptable.

Progress: The following research areas were emphasized: 1) A laboratory bioassay using cut cotton leaf petioles in varying concentrations of imidacloprid solutions was used to estimate the susceptibility of silverleaf whitefly adults reared from nymphs on field-collected tomato foliage to the systemic insecticide. The resistance ratios of LC50 values of the field populations to that of a susceptible laboratory colony from 10 sites ranged from about 4 to 21 and averaged about 15. Field collected efficacy data indicated that whiteflies were not out of control at 3 sites. Resistance ratios declined to lower levels after the whiteflies were reared in the laboratory for three generations without exposure to imidacloprid; however, higher ratios were detected in one field population after being reared for only one generation on tomato plants treated with the LC50 of the susceptible colony. When this population was bioassayed for susceptibility to thiamethoxam using the same technique, the LC50 value was comparable to that of the laboratory colony. However, when the population was reared for one generation on tomato plants treated with the LC50 value of the laboratory colony for thiamethoxam, the thiamethoxam resistance ratio was nearly 11, thus indicating the potential for development of field populations with reduced susceptibility to both imidacloprid and thiamethoxam. 2) A laboratory, no-choice bioassay was used to screen 23 products or chemicals for repellency to silverleaf whitefly adults. None of the products or chemicals were more repellent than the paraffinic oil used as a standard. 3) A greenhouse choice bioassay was used to evaluate various encapsulated oils and volatile chemicals alone or combined with vegetable oils for repellency to silverleaf adults. None were consistently more repellent than the paraffinic oil used as a standard. 4) Soil applications of two nicotinoid insecticides, imidacloprid and thiamethoxam, were compared for whitefly control on tomato at two commercial farms and at the University of Florida Gulf Coast Research and Education Center. Both nicotinoids reduced the numbers of whitefly nymphs relative to non-treated plants for at least eight weeks after treatment. 5) Sound trapping for adult mole crickets and a tachinid parasite were continued. 6) Insecticides, miticides, insecticide combinations and insecticide rotations were evaluated in field trials for control of the silverleaf whitefly, armyworm larvae, spider mites, the broad mite and the pepper weevil. 7) Different formulations of pheromones/attractants were evaluated as lures in double-sided sticky traps for trapping pepper weevil adults. None were found to result in higher trap catches than the standard, commercially available lure.

Impacts: The use of adult repellents, especially for protecting tomato seedlings in transplant production houses, could improve management of whitefly-vectored viruses with reduced, adverse environmental impact. Monitoring of field populations of the silverleaf whitefly for susceptibility to imidacloprid and thiamethoxam is an essential part of a resistance management program and will help ensure the continued availability of these indispensable insecticides for whitefly control. The identification of pesticides and

pesticidal rotations will help ensure the continued management of key arthropod pests of vegetable crops grown in Florida and elsewhere.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-DOV-03586

Title: ***THE EPIDEMIOLOGY AND CONTROL OF STRAWBERRY DISEASES***

Critical Needs:
National Goals: 1, 4
Key Themes: plant diseases; fruit; strawberries; plant disease control; epidemiology; integrated control (diseases); fungus diseases (plants); colletotrichum; botrytis cinerea; phomopsis; field studies; laboratory tests
Summary: Certain microbes cause diseases on strawberry. This project studies these microbes and developes new and improved methods for controlling their diseases.
Progress: During calendar 2003, 39 fungicide products or treatment strategies were evaluated for the control of anthracnose fruit rot (AFR), Botrytis fruit rot (BFR), and powdery mildew (PM) diseases of strawberry. Late season applications of cyprodinil + fludioxonil, but not azoxystrobin, significantly improved AFR control when added to a standard captan program. Four applications of CX7001, fenhexamid, fludioxonil, or cyprodinil + fludioxonil during the second peak flowering period were highly effective for the control of BFR. A1639, quinoxyfen, triflumizole alternated with sulfur, and sulfur alone controlled PM growth on strawberry achenes. Iron compounds were shown to suppress infections by Colletotrichum acutatum in greenhouse tests. Additional chemical trials were carried out to test the efficacy of pre-plant dip treatments for the control of anthracnose root necrosis, and late season foliar application for the control of post-harvest BFR. Strawberry transplants treated with azoxystrobin, cyprodinil + fludioxonil, or hydrogen peroxide had higher survival rates and increased plant vigor 47 days after transplanting. A pre-harvest application of fenhexamid, but not cyprodinil + fludioxonil, reduced the development of post-harvest BFR in fruit stored 7 days at 2-4 degrees C. The epidemiology of Colletotrichum acutatum (the causal agent of AFR and anthracnose root necrosis) and C. gloeosporioides (Colletotrichum crown rot) were studied in replicated field experiments. Strawberry flowers and ripening fruit were more susceptible to infection by C. acutatum than green fruit. C. acutatum persisted over the summer on simulated escaped plants in the field. C. gloeosporioides spread from plant to plant under field conditions when fungicides were not applied.
Impacts: Experimental findings are communicated to strawberry growers through the Berry Vegetable Times newsletter, grower meetings (e.g. AgriTech) and in personal recommendations for plant disease control. As a result of these efforts, Florida growers are able to produce healthier strawberry crops with fewer fungicide inputs. Profitability is increased through reduced production costs and increased marketable yield. Safety concerns such as residues and worker exposure are also addressed.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-DOV-03764

Title: ***STRAWBERRY CULTIVAR DEVELOPMENT***

Critical Needs:
National Goals: 1
Key Themes: strawberries; cultivars; plant improvement; plant genetics; fruit quality; crop yields; winter hardiness; colletotrichum; tetranychus urticae; plant disease resistance; plant insect resistance; plant

introductions; plant breeding; plant evaluation; micropropagation; molecular biology; fragaria; crosses; plant disease control
Summary: Low early season yield, lack of fruit firmness, and susceptibility to anthracnose fruit rot are three of the most serious problems facing the west central Florida strawberry industry. The purpose of this project is to develop cultivars that produce high early season yields of firm, anthracnose-resistant fruit.
Progress: Approximately 4,000 new genotypes were evaluated in a fruiting field trial at the Gulf Coast Research and Education Center-Dover during the 2002-2003 season. One hundred and nineteen (119) of these genotypes were selected for inclusion in future clonal trials. Festival x FL 00-114, FL 97-39 x FL 00-111, and Festival x FL 00-108 were the crosses that produced the highest percentage of seedlings with acceptable fruit quality. Three hundred (300) selections were evaluated in an observational (stage 2) trial containing one or two 10-plant plots per selection. FL 95-111, FL 95-269, FL 98-75, FL 99-117, FL 99-140, FL 01-78, FL 01-89, FL 01-91, FL 01-92, FL 01-98, FL 01-116, FL 01-133, FL 01-210, FL 01-216, and FL 01-221 received high marks for fruit attractiveness and will be evaluated in a replicated trial during the 2003-04 season.
Impacts: Festival, a genotype that was released from this program in 2000, currently occupies over 50 percent of the Florida strawberry acreage.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-ENH-03600

Title: ***MORPHOLOGICAL AND PHYSIOLOGICAL RESPONSES OF CHIMERAL PLANTS TO ENVIRONMENTAL FACTORS***

Critical Needs:
National Goals: 1
Key Themes: plant physiology; plant morphology; environmental factors; plant response; cultural practices; leaf development; variegation; photosynthetic efficiency; chimeras; ontogeny; light intensity; light quality; irradiation; chlorophylls; flavonoids; chloroplasts; cell ultrastructure; carotenoids; microscopy
Summary: The shape and function of plant leaves produced in different environments often differ dramatically. Environmental effects on the way leaves develop can be determined easier using plants with variegated leaves. This project examines how leaves develop in response to different environmental factors.
Progress: Publications in preparation show that morphological and physiological responses of chimeral foliage plants when plants are tranferred from production light levels (500-1,000 micromols)to very low light light levels typical of most building interiors (4,8,16 micromols) is consistent within genera but changes in per cent leaf variegation is cultivar dependent. Past research has shown that per cent leaf variegation of new leaves may increase or decrease when production light levels decrease. This response is species dependent and is develomentally integrated over time. Consequently plants transfered from high light environments to low light environments in sequence to their rate of leaf production will exhibit a morphologial and anatomical response that is intermendiate between the two extremes.
Impacts: Knowledge of specific cultivar responses wil permit commerical growers and interiorsccapers to grow/use the best plants in specific locations.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ENH-03602

Title: ***TAXONOMY AND BOISYSTEMATICS OF CULTIVATED PLANTS***

Critical Needs:
National Goals: 1
Key Themes: plant taxonomy; biosystematics; cultivated plants; plant identification; wild plants; classification systems; euphorbiaceae; plant propagation; plant introductions; conservation; endangered plants; plant anatomy; plant morphology; electrophoresis; chromosome number; microscopy
Summary: Resolution of relationships, classification, and nomenclature of cultivated plants. The intent of this project is to facilitate understanding of the cultivated plant groups in horticulture and to assure accuracy of their identification in the trade.
Progress: A Taxonomic Monograph of the Neotropical Species of Jatropha (Euphorbiaceae). Genus Jatropha consists of about 175-200 species of which more than one-half are native to the New World's seasonally dry subtropical regions and the remainder are African and Indian. A revision of the infrageneric taxa of the genus was published in 1979 (Dehgan, B. and G. L. Webster. 1979. Morphology and Infrageneric Relationships of the Genus Jatropha (Euphorbiaceae). Univ. Calif. Press, Botany. Vol. 74). The genus as whole is a variable group of taxa with a number of hybrid complexes. Determination of relationships among these complexes is being evaluated with DNA and other methods. Significant progress has been made in the study and annotation of nearly 10,000 herbarium sheets from various herbaria. Most natural habitats where species of the genus are to be found have been visited and living and dried specimens have been collected. All taxa under study are currently being illustrated and the many living specimens are being photographed for publication. Publication of the monograph in 2004 is anticipated.
Impacts: As perhaps the most primitive member of the Euphorbiaceae, a thorough study of Jatropha and its phylogeny is considerable significance, both within the family and with respect to related families. Moreover, several species of Jatropha, particularly those in the section Curcas are currently under extensive cultivation for production of hydrocarbons and several species are being studied for their medicinal value.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ENH-03609

Title: ***INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS***

Critical Needs:
National Goals: 1
Key Themes: floriculture; ornamental plants; information collection; plant evaluation; plant introductions; nursery stock; plant breeding; annual plants; perennial plants; grasses; foliage plants; turf grasses; information dissemination; genetic stocks; new varieties; screening systems; plant collection
Summary: Florida's climate is ideal for the growth of semi tropical and tropical plant species. Plant collections throughout the world are needed to evaluate new plant materials for use in Florida's multi-billion dollar ornamental plant industry. To provide statewide reporting of activities involved in collection and evaluation of plant taxa which may be used as source materials for release to industry or other projects. Also to provide listings of plant taxa that are unsuitable because of poor adaptive traits, poor quality factors, or dangers of becoming weed pests.
Progress: Cool-season turfgrass blends, mixtures, and pure stands totalling 30 entries were overseeded on a 'Tifdwarf' bermudagrass putting green and on a 'TifSport' bermudagrass fairway at Gainesville, FL. National Turfgrass Evaluation Program trials involving 34 seeded and vegetative bermudagrasses, 12 St. Augustinegrasses, and 24 Zoysiagrasses were terminated after four years of growth at Gainesville, FL. Seven bermudagrasses selected in Hawaii were no better than a 'TifSport' bermudagrass control cultivar after four years of growth at three golf course locations in North, Central, and South Florida.

Impacts: No Impact
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-ENH-03669

Title: ***EFFECTS OF HORTICULTURE, GARDENING EXPERIENCES, AND GREEN SPACES ON HUMAN POPULATIONS***

Critical Needs:
National Goals: 5
Key Themes: horticulture; human psychology; education; home gardening; green space; social values; gardens; botanical gardens; colleges; universities; quality of life; program evaluation; therapeutics; education programs
Summary: Investigate responses of individuals to horticultural environments as well as specific horticultural programs designed to improve quality of life. Therapeutic and educational effects will be explored through knowledge, attitudinal, and evaluative inventories.
Progress: Publications in preparation show that gender differences affect gardening contraints with females identifying time while males identifed others factors.
Impacts: The results of this study will be used to increase the behavorial changes of demonstration gardens established by the Florida Cooperative Extension Service that illustrate the principles of sustainable landscapes. This will reduce the non-point sources of pollination that traditional landscape and gardening practices produce.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ENH-04069

Title: ***CULTURAL SYSTEMS FOR SPECIALTY CUT FLOWERS AND OTHER NEW ORNAMENTAL CROPS FOR FLORIDA***

Critical Needs:
National Goals: 1
Key Themes: ornamental plants; cut flowers; new crops; plant evaluation; plant development; cultivars; plant performance; landscape plants; specialty crops; ornamentals; niches; alternative crops; cultural practices; pre harvest; stress tolerance; production systems; economic growth; market competition; plant physiology; plant morphology
Summary: The development of cultural management strategies for the specialty cut flower and new ornamental crops industries in Florida will enhance the growth and competativeness of these industries. These strategies include application of cultural information based on fundamental growth, physiology, and morphology studies of cut flowers and of other ornamental plants. The purpose of this study is to develop basic cultural information on specialty cut flowers and other new ornamental crops for Florida.
Progress: No Progress
Impacts: No Impact
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-ENY-03694

Title: ***MANAGING PLANT-PARASITIC NEMATODES IN SUSTAINABLE AGRICULTURE WITH EMPHASIS ON CROP RESISTANCE***

Critical Needs:
National Goals: 1
Key Themes: plant nematodes; parasitic nematodes; nematode control; plant nematode relations; sustainable agriculture; nematode genetics; plant nematode resistance; nematodes; root knot nematodes; peanuts; plant genetics; genotypes; plant breeding; infestation; plant disease control; cotton; vegetables; soybeans; cultivars; cropping systems; persistence
Summary: Root-knot nematodes cause serious plant disease on a number of agronomic and vegetable crops in Florida. This project seeks a sustainable solution to the root-knot nematode problem by developing plants with resistance to the nematode.
Progress: Pasteuria penetrans is suppressive to Meloidogyne arenaria race 1 in a peanut field in Levy County, FL. Our objective was to determine the persistence of P. penetrans in this site by determining the density of the bacterium following 9 years of growing bahiagrass, rhizomal peanut, and weed fallow. The treatments were chosen to included root-knot nematode nonhosts (bahiagrass and rhizomal peanut) and weed hosts, hairy indigo and alyce clover (weed fallow) The plots were established in a randomized complete block design and replicated 10 times in the summer of 1991. The plot size was 38 by 10.6 m. In 1999, the bahiagrass and weed fallow plots were deep plowed, disked, and cv. Florunner peanut planted. Glyphosate was sprayed over the rhizomal peanut in the summer of 1999 and they were deep plowed and disked in the spring of 2000. All plots were planted to cv. Southern Runner peanut in the spring of 2000 and cv. Georgia Green in the spring of 2001. In 1999, the initial density of M. arenaria second-stage juveniles (J2) was low in all plots and no J2 with endospores attached were recovered. After the first peanut harvest, the only visible symptoms of root knot were in weed fallow plots. Approximately 2.5% of root-knot nematode females recovered from peanut grown in weed fallow plots were endospore filled, and none were recovered from peanut grown in bahiagrass plots. In 2001, the percentage of J2 with endospores attached reached the highest levels between June and August (65.3%, 6.5%, and 2.3% from weed fallow, bahiagrass, and rhizomal peanut, respectively). The percentage of endospore-filled females recovered from peanut grown in weed fallow plots increased to 51.3% in 2001, whereas the percentages in bahiagrass and rhizomal peanut plots were 11.3% and 1.3%, respectively. Peanut yields were significant higher in rhizomal peanut plots followed by bahiagrass, and weed fallow plots over the past 2 years. Peanut roots, pegs, and pods were severely galled in all plots in 2001. In summary, the density of P. penetrans increased in all plots over the 3-year period. The incidence of the bacterium seems to be related to the density of the peanut root knot nematode.
Impacts: The information attained will aid in the sustaining of root-knot nematode management in the future.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-ENY-03723

Title: ***CONSERVATION AND LABORATORY REARING OF BUTTERFLIES***

Critical Needs:
National Goals: 1
Key Themes: insect biology; lepidoptera; resource conservation; insect rearing; synthetic diets; insect nutrition; feeding stimulants; entomology; pollution control; insect growth; host plants; plant insect relations; insect larvae; restricted feeding; host range; insect development; lyophilization
Summary: Test commercial diets available for the painted lady butterfly and diets available for a number of moths. We will add measured quantities of natural host plant material (crushed, ground, or lyophilized) to diets and place newly hatched larvae (or eggs to hatch) on the diet. We will evaluate the diets by standard measures of feeding and growth. Develop laboratory diets for rearing various species of

butterflies with special emphasis on swallowtail butterflies. Define host plant stimulants that may be necessary to get butterfly larvae to feed upon a synthetic diet.
Progress: The phaon crescent butterfly, Phyciodes phaon, can be reared on a completely artificial diet, but the adult females do not lay eggs. These females, however, have mature ovaries and mature eggs in the ovary at emergence, as do females reared on the host plant, Phyla nodiflora. The problem may be a defect in the male internal reproductive structures, and there are some differeces in the testes and associated structures between diet-reared males and host plant-reared ones. Efforts to extract a component or components from the host plant that can be added to the diet and correct the oviposition problem have not been successful thus far. The original artificial diet on which the first successful rearing were made contained no added lipids, glucose, or salt mixture, and addition of olive oil, glucose, and Beck's salt mixture improved survival of the larvae and resulted in about 80% successful rearing to the adult stage. Efforts to rear the checkered white butterfly, Pontia protodice, were continuted in the summer, 2002, but the butterfly still cannot be reared consistently on an artificial diet. One of its major host plants, peppergrass, is not available in the Gainesville area after about July, but the adult females lay readily on commercial broccoli and the larvae eat it. However, in three successive years we have lost the colony on broccoli in late summer to disease. It may be that larvae are more susceptible to disease organisms when being reared on broccoli.
Impacts: Butterflies are important indicators of environmental quality. Larval food plants and nectar plants must be present in the environment to enable butterflies to live in a particular habitat. The capability for rearing butterflies on artificial diets is important to commercial butterfly houses that require a dependable supply of butterflies for display.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ENY-03788

Title: ***DEVELOPMENT OF ECOLOGICAL METHODS FOR NEMATODE MANAGEMENT***

Critical Needs:
National Goals: 4
Key Themes: nematodes; nematode control; integrated pest management; nematode ecology; pest management; sustainable agriculture; cropping systems; plant nematode relations; population control; nematode population; community structure; plant ecology; cultural practices; vegetables; fruit; ornamentals; crop rotation; cover crops; plant nematode resistance; solarization; non chemical control
Summary: Field, laboratory, and greenhouse studies will be used to develop and integrate methods for managing and minimizing nematode impact on vegetable, fruit, and ornamental crops. Methods investigated will include cropping systems, cover crops, rotation crops, plant tolerance, solarization, and other novel methods.
Progress: As an agroecosystem makes the transition from conventional to organic practices, changes in the pest management tactics used are often apparent. Nonchemical methods require a better understanding of nematode biology than traditional chemical management approaches. Nematodes are a highly diverse group of organisms that show a variety of adaptations to extremes in soil and plant environments. Developmental dormancy and diapause are important for seasonal survival and long-term longevity of eggs in some species, whereas changing sex ratios may improve survival chances of the next generation in some instances. More direct and immediate responses to environmental conditions include aggregation or the formation of relatively resistant dauer larvae. Many nematodes can undergo temporary quiescence in response to environmental stress, and entry into anhydrobiosis or other extreme states allows long-term survival in unusually stressful environments. These inactive survival stages may make up a substantial proportion of the nematode population in some terrestrial environments. These nematode survival strategies must be considered if nonchemical management practices are to be used effectively.

Impacts: A wider selection of cover crops and other nonchemical alternatives are now available for managing plant-parasitic nematode problems. These methods can even be used by homeowners and organic growers, for whom nematicides are not an option. However, effective use of these methods requires good biological and ecological information on nematodes and their survival strategies.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ENY-03796

Title: ***BIOLOGICAL CONTROL OF SCAPTERISCUS MOLE CRICKETS***

Critical Needs:
National Goals: 4
Key Themes: scapteriscus; biological control (insects); insect control; insect pests; integrated pest management; turf grasses; pastures; vegetables; regional research; population distribution; larra bicolor; tachinidae; cold hardiness; nectar; feeding; predation; predator prey relations; carabidae; insect larvae; golf courses; population suppression
Summary: Scapteriscus mole crickets, which are native to South America, are the worst pest insects of pasture- and turf-grasses in Florida. Chemical pesticides provide only temporary control, are very expensive, and are potentially harmful to the environment. This project studies how to enhance effects of two biological control agents that already have been established in parts of Florida. It investigates prey-specificity of a third, which has been imported but not yet released.
Progress: The beneficial wasp Larra bicolor has now been detected in 15 counties in north and central Florida. From its initial release in 1988 in Alachua County, its population has spread naturally to most of the others, having been assisted to spread only to Brevard and Charlotte counties. Its detection in other counties was either fortuitous, or collaborators maintained plots of the wildflower Spermacoce verticillata and checked these plots occasionally for presence of adult wasps. It is hoped to find collaborators in many other counties willing to maintain such wildflower plots. It is also hoped to establish wildflower plots in distant counties, where the wasp is unlikely to be present, and redistribute wasps from Alachua County to them. Spermacoce verticillata contains low levels of an alkaloid, but the alkaloid has not prevented its use as a forage for cattle. Its nectar is high in sucrose, and its flowers are highly attractive to Larra bicolor, much more so than are five other wildflowers tested by us. It is widespread in southern Florida, was mentioned in a botanical work published in 1860 as being present in the Florida Keys, and thus is arguably native to Florida. Outside Florida, it is believed to be native in the Greater Antilles and to a wider area of the Neotropics. It occupies southern areas of some Gulf Coast states. At present, it is the most promising candidate for use in wasp-gardening (like butterfly-gardening) where the services of Larra bicolor would be useful to suppress populations of pest mole crickets. Traps baited with synthetic mole cricket sound have now been operated at two sites near Gainesville for 24 years. They catch adult tawny and southern mole crickets and act as population monitoring devices, showing changes from year to year. As measured by these traps, populations began to decline about 1992, a few years after Larra bicolor and the nematode Steinernema scapterisci had reached the trap locations after release elsewhere. The latest data (for the year 2002-2003) show that tawny mole cricket populations have fallen to less than half of 1% of what they were on average before biocontrol agents were released.
Impacts: Biological control of pest mole crickets in the Gainesville, Florida area has been achieved by introduction, release and establishment of two classical biological control agents acting together: the wasp Larra bicolor and the nematode Steinernema scapterisci. In 2002/2003 the level of control exceeded 95% for southern mole crickets and 99.5% for tawny mole crickets as contrasted with the average for nine years before these biocontrol agents were released. The future of the project is to extend this level of biological control throughout Florida. A still higher level of control is being sought by management of populations of some of the biocontrol agents.
Source of Federal Funds: Hatch

Scope: State

Project Number: FLA-ENY-03942
Title: ***TOXICOLOGY OF AGRICULTURALLY IMPORTANT INSECT PESTS OF FLORIDA***
Critical Needs:
National Goals: 1
Key Themes: insect pests; insect control; detoxification; insecticide resistance; synergists; insecticides; defense mechanisms; enzyme inhibitors; spodoptera frugiperda; microsomes; glutathione transferases; allelochemicals; regional research; corn; insecticide resistant insects; enzyme characterization; protein purification; performance testing; insect larvae; biological activity; bioassays
Summary: A. Insecticides are becoming less effective because of the development of resistance in insects. B. Resistance management is very important for prolonging the usage of insecticides. A. This study is to learn more about the in vivo inhibitors of glutathione transferases in insects. B.This study is to learn more about the mechanisms of insecticide detoxification and resistance in insects.
Progress: A strain of the fall armyworm, Spodoptera frugiperda (J.E. Smith), collected from corn in Citra, Florida, showed high resistance to carbaryl (562-fold) and methyl parathion (354-fold). Biochemical studies revealed that various detoxification enzyme activities were higher in the field strain than in the susceptible strain. In larval midguts, activities of microsomal oxidases (epoxidases, hydroxylase, sulfoxidase, N-demethylase, and 0-demethylase) and hydrolases (general esterase, carboxylesterase, beta-glucosidase) were 1.2 to 1.9-fold higher in the field strain than in the susceptible strain. In larval fat bodies, various activities of microsomal oxidases (epoxidases, hydroxylase, N-demethylase, 0-demethylase, and S-demethylase), glutathione S-transferases (CDNB, DCNB, and para-nitrophenyl acetate conjugation), hydrolases (general esterase, carboxylesterase, beta-glucosidase, and carboxylamidase) and reductases (juglone reductase and cytochrome c reductase) were 1.3- to 7.7-fold higher in the field strain than in the susceptible strain. Cytochrome P450 level was 2.5-fold higher in the field strain than in the susceptible strain. In adult abdomens, their detoxification enzyme activities were generally lower than those in larval midguts or fat bodies; this is especially true when microsomal oxidases are considered. However, activities of microsomal oxidases (S-demethylase), hydrolases (general esterase and permethrin esterase) and reductases (juglone reductase and cytochrome c reductase) were 1.5- to 3.0-fold higher in the field strain than in the susceptible strain. Levels of cytochrome P450 and cytochrome b5 were 2.1 and 2.9-fold higher, respectively, in the field strain than in the susceptible strain. In addition, acetylcholinesterase from the field strain was 2- to 85-fold less sensitive than that from the susceptible strain to inhibition by carbamates (carbaryl, propoxur, carbofuran, bendiocarb, thiocarb) and organophosphates (methyl paraoxon, paraoxon, dichlorvos), insensivity being highest toward carbaryl. Kinetic studies showed that the apparent Km value for acetylcholinesterase from the field strain was 56% of that from the susceptible strain. The results indicated that the insecticide resistance observed in the field strain was due to multiple resistance mechanisms, including increased detoxification of these insecticides by microsomal oxidases, glutathione S-transferases, hydrolases and reductases, and target site insensitivity such as insensitive acetylcholinesterase. Resistance appeared to be correlated better with detoxification enzyme activities in larval fat bodies than in larval midguts, suggesting that the larval fat body is an ideal tissue source for comparing detoxification capability between insecticide susceptible and -resistant insects.
Impacts: Understanding the molecular mechanisms of insecticide resistance will help us develop more effective methods of resistance management.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ENY-03961

Title: ***SELECTION OF HONEY BEES FOR SUPPRESSED REPRODUCTION OF THE PARASITIC VARROA MITE AND MAPPING OF THE QUANTITATIVE TRAIT LOCI (QTL) INVOLVED***

Critical Needs:
National Goals: 1
Key Themes: apis mellifera; varroa destructor; aflp; mites; insect breeding; reproduction; genetic markers; genetic mapping; quantitative genetics; traits; gene loci; selection; insect genetics; molecular genetics; bees; performance evaluation; genotypes; homozygosity; heterozygosity; infestation; recombination; computer software; gene analysis; linkage (genetics); statistical analysis
Summary: The parasitic mite Varroa destructor has devastated honey bee populations world-wide. Chemicals used to control the mite have contaminated wax and honey and have selected resistant mites. Suppression of mite reproduction (SMR) is one of the most promising of the honey bee's natural defenses against the Varroa mite. The goals of this project are to select for SMR and to find associated DNA markers, thereby locating the genes responsible along genetic maps (QTL).
Progress: The goal of this project is to find DNA markers (AFLPs) in honey bees that are associated with SMR (suppression of Varroa mite reproduction), thereby locating the responsible genes (quantitative trait loci - QTL) along genetic maps. For this project, drone progeny are produced from queens that are hybrids between SMR and susceptible (SUS) bees. In these drones, markers are identified that have segregated along with SMR genes expressed by the drones' worker offspring. Dr. John Harbo, (USDA-ARS, Baton Rouge) has provided SMR and SUS queens. During the year 2002 and into 2003, SMR stock was maintained by crossing progeny of different SMR queens, whereas SUS stock was inbred for several generations. The inbreeding was intended to eliminate any SMR tendency, to enhance differential expression among bees with SMR and SUS alleles. Crosses were made between SMR and SUS bees, from which hybrid daughter queens were raised. For the tests, drone progeny from one hybrid queen were used to singly inseminate super sister (same father) queens, about 50 of which were introduced into separate small hives containing about the same numbers of bees and mites. The proportion of non-reproductive mites in the second brood cycle was determined (SMR expression is delayed). Two tests were conducted this year. In the first test, the drones were crossed to SUS queens, but these queens failed to lay eggs, perhaps a consequence of being highly inbred. In the second test, the drones were crossed to SMR queens. Being late in the season, only a fraction of the test colonies survived from which levels of SMR were determined. However, these colonies provided useful information. Levels of SMR expression were as expected. The results suggest that, at most, a few loci are involved. The use of inbred SUS lines appears not to be necessary to obtain differential expression. The procedure for AFLP analyses was modified slightly to obtain clearly defined markers. To date, about 50 distinguishing markers have been found among the drones used for the tests. A total of about 500 markers are expected to be found. The tests will be repeated in 2004, to obtain the amount of data necessary to identify the QTLs.
Impacts: The parasitic mite Varroa destructor has devastated populations of the western honey bee, Apis mellifera, world-wide. Chemical acaricides used to control the mite have contaminated beeswax and honey, and mites have developed resistance to the chemicals. Satisfactory control must ultimately draw from the bees' natural defenses, such as an ability to suppress mite reproduction (SMR). SMR is latent in bee populations and can be greatly enhanced through selective breeding. Selection of different lines honey bees for SMR may reduce or eliminate the need for chemical control. Through QTL mapping, the genomic regions responsible for SMR should be revealed. Thereafter, marker-assisted selection, with flanking DNA polymorphisms, may facilitate the introduction of SMR into stocks already selected for other desirable traits, e.g. productivity and temperament.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ENY-04011

Title: ***A COMPARATIVE ANALYSIS OF PLANT AND INSECT PARASITIC NEMATODES: A NOVEL APPROACH TO CONTROLLING INSECT PESTS AND PLANT PATHOGENS***

Critical Needs:
National Goals: 1, 4
Key Themes: parasitic nematodes; evolution; coevolution; parasitism; phylogenetics; entomopathogens; systematics; nematode genetics; comparative analysis; insect pests; insect control; biological control (insects); dna sequences; gene analysis; caenorhabditis elegans; gene expression; temporal distribution; localization; gene mapping; host parasite relations; polymerase chain reaction; gene cloning; steinernema; heterorhabditis
Summary: Some parasitic nematodes are plant pathogens, others provide beneficial services by controlling pest insects. Understanding the genes involved in parasitism and which nematodes have them is a crucial first step to utilizing genetic information to suppress or enhance parasitism. The purpose of this project is to identify common genes involved in parasitism and understand their evolutionary relationships. This knowledge can be used to control plant parasitic nematodes and enhance the effectiveness of insect parasitic nematodes.
Progress: In the last year progress was made in the following areas: 1. Numerous species of plant parasitic Tylenchid nematodes were collected, identified, sequenced, and added to the growing multiple sequence alignment for phylogenetic analysis. Preliminary alignments were optimized and phylogenetic trees explored. Meloidogyninae (root-knot nematodes) and Heteroderidae (cyst nematodes), two of the most damaging groups of plant parasites previously thought to be closely related are shown to not be sister taxa. Instead, the Meloidogyninae are most closely related to the Hemicycliophoridae. This finding will significantly impact genome projects that aim to extend and identify genetic controls of parasitism in root-knot and cyst nematodes because they are much more distantly related than heretofore imagined. 2. Species boundaries for populations of Xiphinema (lance nematode) and Belonolaimus (sting nematode) have been explored in detail. New taxa have been identified that are correlated with expansions of host range and other bionomic factors. Species previously thought to be benign have been indicted in host range expansion. We show that these populations actually represent new, undescribed species that have probably invaded from non-agricultural hosts. 3. Several new taxa of insect parasitic nematodes have been identified and are currently being described as new species and assayed for their ability to control pest insects, particularly mole crickets and the citrus root weevil. 4. The genetic structure of numerous (over 70) strains of endosymbiotic bacteria of insect pathogenic nematodes have been identified and characterized and are currently being used to inform genome exploration and microarray projects. 5. The origin and maintenance of nematode parasitism, and surveys of geographic distribution and host ranges of mollusks has been studied as a prelude to using nematodes as control agents of pest gastropods.
Impacts: 1. Our work on the phylogenetics of plant parasitic nematodes shows that the assumption of evolutionary similarity among major plant parasitic nematodes is bogus and could lead to a significant amount of ineffective research effort.. (= saving billions of dollars worldwide and alleviating much human suffering due to malnutrition) 2. Now that we know that tnewly discovered damage to citrus and strawberry is due to highly structured and genetically divergent evolutionary lineages (different species, not just variation among populations), growers now have the information they need to make more informed choices about the measures needed to take for improved crop protection. (= saving millions of dollars statewide in citrus and strawberries) 3. Use of indigenous nematodes to control pest insects are more effective, and offer longer lasting protection, than the non-native entomopathogenic nematodes. (= millions of dollars saved due to decreased cost of pest control; decreased impact on native habitats). 4. Because we have shown that some bacteria associated with entomopathogenic nematodes do not always show high levels of host fidelity, workers in biological control will need to contend with the fact that nematodes can pick up non-native endosymbionts and move them to unintentional (or intentional) targets. (= significant tool for further genetic dissections, improved pest management)
Source of Federal Funds: Hatch

Scope: State

Project Number: FLA-ENY-04012-L

Title: ***BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES***

Critical Needs:
National Goals: 1
Key Themes: insect pheromones; insecticides; insect traps; tomatoes; peppers; bemisia; aphididae; insect biology; crop production; environmental impact; natural enemies; pesticide evaluation; monitoring; crop damage; mating disruption; field studies; comparative analysis; performance evaluation; insect control; anthonomus eugenii; keiferia lycopersicella; spodoptera exigua
Summary: Tomato and peppers are major vegetable crops produced in Florida, which are impacted by a diverse assemblage of pests. The majority of pesticides used for managing vegetable pests are toxic and eliminate natural enemies that regulate key pest populations. This project aims to develop new management techniques for key insect pests of vegetables. Our goal is to reduce or eliminate the number of sprays used for managing key vegetable pests
Progress: During the 2003 field season, samples were collected from zucchini located at the Plant Science Research and Education Unit in Citra, Florida. Zucchini were planted on seven 2-foot beds spaced 4 feet apart. Treatments included two synthetic mulches (white and reflective), two living mulches (buckwheat and white clover), and a bare ground (control). Zucchini and living mulches were planted on September 29th, and sampling took place between October 13th and November 17th. Living mulch treatments that included buckwheat and white clover were planted inter-row. Treatments were replicated four times in a randomized block design with each block spaced 52 mapart. Aphid and whiteflies were sampled weekly for 6 weeks beginning October 15th. White mulch had significantly more aphids in treated plots compared with other treatments including the control. Also, more symptoms of squash silverleaf disorder were recorded on white mulch compared with other treatments including the control. Data from counts of immature whiteflies also showed that white mulch had significantly higher numbers of immatures compared with other treatments (with the exception of buckwheat). Alternately, the reflective mulch had significantly fewer aphids and whiteflies compared with other mulch treatments. With the exception of the reflective mulch, buckwheat had significantly fewer adult whitefllies than other treatments. Zucchini planted within the clover mulch and bare ground (control) had significantly higher levels of viral infection compared with other mulch treatments. Data taken at the end of the season revealed that two viral strains, PRSV-W and WMV-2 were present in the field. Our yield data revealed that significantly more marketable zucchini were harvested from plots with reflective and white mulch compared with all other treatments including the control. Overall, buckwheat plots produced significantly higher yields than plots treated with clover as well as the control plots. However, zucchini planted in plots treated with reflective mulch had significantly larger fruit than all other treatments including the control.
Impacts: The use of living mulches will allow the natural decomposition of organic matter (from mulches) in the field. This will ultimatele reduce the labor cost involved in the removal of synthetic mulch from the field. In addition, the use of reflective or living mulch will reduce reliance on the use of toxic pesticide for managing key pests in cucurbits.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-ENY-04012-W

Title: ***BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES***

Critical Needs:
National Goals: 1, 4

Key Themes: vegetables; insect control; potatoes; beneficial insects; economic injury threshold; sampling; disease vectors; plant viruses; brassica; cucurbitaceae; aphididae; bemisia; vespidae; parasitoids; predators; insect biology; insect ecology; disease transmission; communities (ecology); community structure; natural enemies; cultural practices; insect population; estimation; squash; crop yields; field tria
Summary: Florida vegetables are attacked by a great variety of pests and many traditional chemical control options are being lost. This project seeks to enhance our understanding of the biology and ecology of crop systems with regard to insects and to develop reduced-risk alternatives to manage pests and conserve beneficial insects.
Progress: Colorado potato beetle (CPB) has a long history of becoming resistant to insecticides in other parts of the country. New materials, preferably not harmful to beneficial insects, need to be evaluated. Older standard materials, such as aldicarb, may be not as effective as in the past, and this also needs to be confirmed so that growers can make profitable choices when considering control strategies. We tested several new insecticides for control of CPB and aphids in the spring of 2003. Some of these newer chemicals (dinotefuran, for example) were very effective for both aphid and CPB control. On the first sampling date, there were almost 90 small CPB larvae per plant on untreated plants and none on those treated with dinotefuran. On the other hand, aldicarb was not very effective (43 small larvae per plant) and needs further evaluation. A heavy rain soon after planting may have reduced its efficacy. By the last sampling date, there were almost 50 adult CPB per plant in the untreated check and an average of only 0.05 adults on the dinotefuran-treated plants. A Bacillus thuringiensis product (Novodor) was very effective (0.05 adults per plant on the last sampling date) and when combined with an insecticide specific for aphids, provided excellent control without harming beneficial insects. Unfortunately, Novodor is unlikely to be registered in Florida because of the limited market. The new challenge for growers will be using the neonicotinoids (like imidacloprid, thiamethoxam and dinotefuran) in a way that minimizes the development of resistance. Resistance to this class of chemicals has already developed in other parts of the country. Cultural and biological controls should be explored.
Impacts: Information from this trial will be used in a presentation to growers and will help them make good choices in insect management. The apparent resistance to aldicarb will help make them realize the need to use pesticides wisely. We may be able to prevent the development of resistance to neonicotinoids by providing alternatives and identifying gaps in our management strategies.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-ENY-04025
Title:

Critical *CHEMICAL ECOLOGY AND MANAGEMENT OF INSECT PESTS OF BLUEBERRY, VACCINIUM SPP., IN FLORIDA*

Needs:
National Goals: 1, 4
Key Themes: insect pheromones; phenology; sampling; insect control; insect ecology; plant insect resistance; volatile substances; biological control (insects); plant biochemistry; blueberries; thrips; midges; rhagoletis mendax; insect pests; vaccinium; plant genetics; crop production; risk assessment; insect biology; insect behavior; cultivars; breeding lines; plant evaluation; surveys; life history; sex pheromones; plant accessions; predators; parasitoids; insect identification
Summary: Insect pests are increasing in abundance and are now limiting blueberry production in Florida. The purpose of this project is to determine nonchemical ways to manage blueberry insect pests.
Progress: Techniques to detect life stages of blueberry gall midge (cranberry tipworm) and thrips were evaluated in rabbiteye and southern highbush blueberry. Three monitoring techniques for gall midge were evaluated: 1) unbaited yellow sticky boards, 2) collection of bud samples for emergence, 3) collection of bud samples for dissection. Floral and vegetative buds were collected separately. In our rabbiteye

planting, the emergence technique detected significantly more adults in floral buds compared with either yellow boards or dissection techniques. In leaf buds, yellow sticky boards were more effective in detecting adults than emergence or dissection techniques. Similar numbers of larvae were detected using emergence and dissection techniques in floral and leaf buds. Eggs were only detected with the dissection technique. In the southern highbush planting, the emergence technique was significantly better in detecting adults in floral and leaf buds compared with yellow sticky boards or dissection techniques. No eggs were found in southern highbush floral buds. Various colors of unbaited sticky board traps were used to monitor flower thrips: 1) standard pantone yellow, 2) safety white, 3) walnut husk green and 4) thrips blue. White, blue, and yellow sticky traps captured significantly more thrips than green in rabbiteye and southern highbush plantings. Three other techniques were evaluated for their ability to detect flower thrips population in blueberry plantings: dipping flower clusters into alcohol, tapping floral clusters onto a white surface and collecting floral clusters for dissection. In rabbiteye plantings, white sticky boards were significantly more effective in detecting flower thrips than the other techniques evaluated. Alcohol dip and floral dissection techniques were equivalent in their abilities to detect thrips. Frankliniella bispinosa was the most abundant species of flower thrips encountered, comprising more than 95% of the total thrips in our samples. Other species recorded were F. tritici and F. occidentalis. We recorded Rhagoletis mendax adults in 3 of the 4 counties that were monitored in Georgia. We found no blueberry maggot in our surveillance studies in Florida. Seven insecticides treatments were evaluated for control of gall midge and flower thrips: diazinon, malathion, thiamethoxam, spinosad, azadirachtin, Surround and an untreated control. Diazinon-treated blueberry bushes had significantly fewer gall midge larvae compared with buds treated with other compounds. In Florida, Surround was the only insecticide that significantly reduced flower thrips populations whereas in Georgia, malathion and Ecozin were the most promising compounds. Preliminary observations of gall midge mating behavior indicate that a volatile pheromone perceived from some distance is probably involved in mate location. In a greenhouse, male gall midge were observed orienting in flight to a stationary female on a blueberry leaf. Males appeared to follow an odor plume and then hovered close to the female. Males landed on the leaves, oriented and walked to the female. After brief wing fanning, copulation took place and lasted approximately 3 minutes.
Impacts: Developing an effective monitoring technique will allow growers to detect the presence of gall midge and thrips early in the season. This will allow growers to make management decisions that may minimize the use of pesticides. The use of reduced-risk pesticides will enable growers to use less toxic compounds for managing key pests; thereby minimizing the negative effects on the environment.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-FME-03966

Title: ***PREDICTING MOSQUITO-BORNE DISEASE TRANSMISSION IN FLORIDA***

Critical Needs:
National Goals: 1, 2, 3, 4
Key Themes: disease transmission; west nile virus; encephalitis; equine encephalitis; culicidae; disease outbreaks; risk assessment; mapping; epidemiology; disease vectors; virus diseases (animals); human diseases; zoonoses; hydrology; quantitative analysis; real time (computers); monitoring; mathematical models; predictive models; arbo viruses; animal diseases; wildlife
Summary: Mosquito-borne pathogens present a significant health risk to Florida residents, domestic animals and wildlife. This project will help identify periods when the risk of disease transmission is unusually high in Florida.
Progress: Field studies to predict mosquito-borne encephalitis epidemics in Florida continued at the Florida Medical Entomology Laboratory (FMEL) during the federal fiscal year 10-1-02 through 9-30-03. West Nile (WN) virus continued to spread through Florida during the 2002/2003 transmission season. The main focus of WN transmission during 2003 was in the western panhandle and in southwest Florida.

Eighty-nine human cases of WN were reported and were largely sporadic in their geographical and temporal distributions. The cumulative WN epicurve for Florida can be viewed at http://eis.ifas.ufl.edu. The first Florida human WN case of 2003 was reported in Okaloosa County in June and the final case was from Madison County in November. Even in counties with substantial numbers of human cases (Bay County with 13 cases and Escambia with 12), transmission was not focused in time, but was sporadic over the entire transmission season. The first 3 years of WN virus transmission to humans in Florida has been sporadic. A major WN epidemic (4,156 cases and 284 deaths) was reported in 2002 along the Mississippi and Ohio River basins. Likewise, a major (8,912 cases and 211 deaths) WN epidemic was reported during 2003 in and around Colorado. To date, Florida has escaped a major WN epidemic. If Florida experiences an epidemic similar to the one observed in Colorado during 2003, there will be 10,000 human cases and 300 deaths in the state. We dedicated much of the 02/03 fiscal year at the FMEL to evaluating the true risk of a widespread WN epidemic in Florida. We used the FMEL Arbovirus Rapid Deployment System (ARDS) to evaluate epidemic risk in Indian River and St. Lucie Counties during the summer of 2003. The ARDS protocol was used to quickly establish actual WN transmission rates in selected areas of each County. We then constructed, updated, and posted arboviral transmission risk maps as part of our Encephalitis Information System that can be viewed at the web site listed above. Maps at this site are updated frequently to reflect the true risk of arboviral transmission in Florida. The arboviral surveillance techniques developed at the FMEL are used to detect and track the mosquito-borne viruses that pose an important threat to the health and well-being of humans and animals in Florida. Our surveillance program centers on collection of data that accurately indicates real-time viral transmission. The components of this surveillance program include measures of viral abundance; vector abundance, age, and infection status; and wild vertebrate amplification host abundance, age and infection status. Our program includes the long-term surveillance of vector populations, the use of sentinel chickens to measure viral presence and transmission patterns, and wild bird surveillance to monitor the abundance and immunological status of avian species that are responsible for rapid arboviral amplification. Clearly, WN virus will remain endemic throughout Florida and now poses a major threat to the economic health of the state. An active, accurate surveillance program is necessary to monitor continued arboviral transmission and the risk of infection for Florida residents and visitors.

Impacts: Infection of humans and domestic animals by mosquito transmitted viruses poses a significant public health threat in Florida. The development of long-term surveillance protocols at the FMEL allows the real-time prediction (and reporting at http://eis.ifas.ufl.edu) of epidemic transmission allowing sufficient time for appropriate public health responses including vector control, media contact, and issuance of Medical Advisories and Medical Alerts prior to the onset of epidemic transmission.

Source of Federal Funds: Hatch

Scope: State

Project Number: FLA-FOS-03513

Title: ***CONTROLLED DIETARY FOLATE EFFECT ON FOLATE STATUS IN ELDERLYWOMEN***

Critical Needs:

National Goals: 3

Key Themes: folates; dietary levels; folic acid; dietary goals; recommendations; human nutrition; nutrient requirements; elderly; women; homocysteine; human metabolism; nutrient levels; nutritional status

Summary: Folate requirements for elderly women have not been studied adequately. Poor folate status can increase the risk for chronic diseases such as heart disease, the leading cause of death in postmenopausal women. The purpose of this project is to learn more about the folate requirements of elderly women.

Progress: This project was the first to report the response to controlled folate intake using a depletion-repletion protocol in women between the ages of 60-85 years. It is also the first to report the impact of the 677 C-T MTHFR polymorphism on folate status and to describe the effect of folate depletion on DNA methylation in response to controlled folate intake. This research provides age-specific evidence in support of the decision to increase the recommended level of folate intake in elderly women. Previous decisions were based on data from younger populations. It also suggests that in response to low folate intake/status, women homozygous for the 677C-T MTHFR polymorphism are at even greater risk for elevation in plasma homocysteine concentration, a risk factor for vascular disease. DNA methylation may also be impaired in response to low folate intake. Hypomethylation of DNA has been associated with increased cancer risk. Finally, we have shown that folate catabolite excretion (total pABG) reflects total body folate pool size and is a long-term indicator that parallels functional measures of folate status. A total of 4 peer-reviewed papers and 4 abstracts have resulted from this work.
Impacts: It is anticipated that the data from this research project will be used to support decisions about the amount of folate to recommend for elderly women in future revisions of the the Dietary Reference Intakes. It also is anticipated that our findings will be used in considering the impact of genetic polymorphisms on folate requirements and potential for disease risk.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FOS-03741
Title: ***FOOD TECHNOLOGY RESEARCH SUPPORT TO FLORIDA AGRICULTURE INDUSTRIES IN VALUE ADDING ENTERPRISES***
Critical Needs:
National Goals: 1
Key Themes: value added; product improvement; phytochemistry; food products; product development; new crops; new products; new foods; food processing; food utilization; food quality; food packaging; food safety; food production; plant pigments; vegetable oils; cooperative research; research planning; fish oil
Summary: There are numerous opportunities to add value to fruits and vegetables produced in Florida by developing new products from these products, or improving the quality and/or form. New and/or improved products and quality could increase the profitability of producing these crops in Florida. The purpose of this project is to improve the quality of fruits and vegetables produced in Florida, and identify new products or opportunities to add value to fruits and vegetables produced in Florida.
Progress: In view of the considerable research going on with anthocyanins in common foods, several Florida crops were subjected to common fermentations in order to establish the potential for adding value and the practicality of optimizing phytochemical extraction and stabilization by fermentation processes. A number of wine fermentations were conducted with Noble muscadine grapes with the idea of maximum extraction of phytochemicals, primarily anthocyanins and tannins, from the fruit. This involved on-hull fermentation to dryness (conversion of all fermentable sugars to ethanol) or subjecting the crushed grapes to a hot press regime at 60C for 1 hr, utilizing macerating enzymes prior to pressing and fermentation. In both cases yields were about 82 percent (about 186 gal per ton fruit) and wines were deeply colored but harshly astringent. Since the wines were unpalatable, fining and aging techniques capable of improving taste without reducing phytochemical value are needed. Honey ale was prepared from unrefined, unfiltered, mixed-source honey, boiled with hops, diluted to original gravity 1.048, and fermented with ale yeast. The resulting bottle primed ale was good quality and represents a potential use for sound but off-grade honey. Red cabbage was subjected to a standard sauerkraut fermentation utilizing 2.25% salt and anaerobic conditions. The kraut was acceptable and possessed an attractive red color with texture and flavor characteristics similar to standard kraut. With both fermented products the comparative changes is phytochemical value are under evaluation.
Impacts: Numerous Florida growers and processors are expressing interest in the nutraceutical value of their crops and processed products. Consequently, we're receiving many inquiries regarding the

qualitative and quantitative phytochemical composition of ingredients and the influence of processing, storage, and distribution on these foods. The cited activities, and other efforts in the areas of teaching and extension synergistically complement the value adding research program and contributes to the total IFAS effort.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FOS-03764

Title: ***STRAWBERRY CULTIVAR DEVELOPMENT***

Critical Needs:
National Goals: 1
Key Themes: strawberries; plant breeding; plant genetics; plant improvement; cultivars; fruit quality; pre harvest; food chemistry; sensory evaluation; crop yields; winter hardiness; colletotrichum; plant disease resistance; plant disease control; tetranychus urticae; plant insect resistance; plant evaluation; harvesting date; food properties; variance
Summary: Strawberry cultivars will be developed with improved quality characteristics.
Progress: Research was conducted to determine the key flavor and aroma compounds in Florida strawberries. Results of this research identified several key aroma impact compounds, including several sulfur-containing compounds. The presence and/or levels of some of these compounds were found to explain much of the sensory variation in Florida strawberries
Impacts: This research will assist the strawberry development program in Florida and will hopefully lead to the production of strawberries in Florida with better taste and flavor.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-FOS-03840

Title: ***BIOTIN METABOLISM IN A RAT MODEL OF SEPSIS***

Critical Needs:
National Goals: 3
Key Themes: biotin; inflammation; immune response; human metabolism; carboxylases; animal models; rats; lipopolysaccharides; biochemistry; nutrient function; human nutrition; immunology; plasma levels; liver; concentration; protein binding; catabolism; vitamins; nutrient deficiency; physiological stress; human physiology; infection; metabolites; endotoxins; urine; hplc (chromatography); localization
Summary: Systemic infections, including those initiated by gram negative bacteria, result in large changes in the metabolism of nutrients. This altered metabolism is correlated with increased morbidity and mortality. This project aims to analyze the effect of an inflammatory response such as sepsis on the metabolism and function of the water soluble vitamin biotin, which is involved in the metabolism of carbohydrate, fat, and protein. It further proposed to determine if individuals who are marginally biotin deficient can respond appropriately to a systemic infection.
Progress: The current CRIS project on the interaction between biotin nutriture and immune function depends upon appropriate animal models. Studies were undertaken to analyze the relationship between dietary biotin intake and biotin metabolism in rats. Biotin status of rats was manipulated through dietary intervention to model moderate biotin deficiency, adequacy, supplementation, and pharmacological biotin supplementation (0, 0.06, 0.6, and 100 mg/kg, respectively). Urinary biotin excretion was directly related to biotin intake, but no difference between biotin adequate and supplemented rats was detected. In contrast, plasma biotin was directly and significantly regulated by biotin intake at every intake level. A hepatic free biotin pool was directly demonstrated in these studies, and like plasma, its size was directly

related to dietary biotin intake. The relationship between dietary biotin intake and protein bound biotin was also analyzed. Moderate biotin deficiency markedly decreased the abundance of each biotinylated polypeptide in rat liver. Biotin supplementation did not significantly elevate the abundance of biotinylated pyruvate, propionyl CoA, methylcrotonyl CoA, or acetyl CoA carboxylase 1. The abundance of biotinylated acetyl CoA carboxylase 2, however, was significantly higher in biotin supplemented rats. Pharmacological biotin intake significantly reduced the abundance of biotinylated propionyl CoA and methylcrotonyl CoA carboxylase. These results indicate that (i) moderate biotin deficiency reduces free and protein bound biotin, (ii) biotin intakes in rats that mimic the currently recommended daily value (DV) do not result in full protein biotinylation, and (iii) pharmacological supplementation may reduce the abundance of functional carboxylases. Overall, these studies suggest that the lack of outward appearances may not be a reliable method by which to assess biotin status in the general population. Glucocorticoid administration is a common method to treat chronic disease states, including inflammatory conditions. The effect of dexamethasone on biotin metabolism was analyzed in rats consuming a purified diet containing a more physiological level of dietary biotin intake (0.06 mg/kg). Acute (5 h) dexamethasone administration (0.5 mg/kg) elicited elevated urinary glucose output as well as elevated urinary biotin excretion and serum biotin. Renal and hepatic free biotin was also significantly elevated by acute dexamethasone administration. Chow fed rats treated with an acute administration of dexamethasone demonstrated significantly elevated urinary glucose excretion, urinary biotin excretion, and serum biotin, but no change in tissue associated biotin was detected. Chronic administration of dexamethasone (0.5 mg/kg i.p.) over four days significantly elevated urinary glucose excretion 42%, but had no effect on urinary biotin excretion, serum biotin, or hepatic or renal associated free biotin. These results demonstrate the existence of novel regulatory pathways for biotin metabolism and the possibility that experimental models with high initial biotin status may mask potentially important regulatory mechanisms.
Impacts: Initial studies into the relationship between biotin nutriture and immunity have demonstrated a significant role for this vitamin in the inflammatory response. Both the metabolism and function of biotin during inflammation appear to be altered, but the mechanisms behind these alterations are as yet unclear. These results are expected to aid in the administration of essential nutrients to the critically ill to reduce morbidity and enhance recovery.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FOS-03910

Title: ***PHYTOCHEMICAL AND QUALITY ASSESSMENT OF FRESH AND PROCESSED FRUITS AND VEGETABLES***

Critical Needs:
National Goals: 1, 2
Key Themes: fruit; vegetables; coatings; food processing; food nutritive value; food chemistry; food quality; antioxidants; fresh produce; thermal processing; phenolics; quality maintenance; post harvest; mangoes; carrots; food composition; regional research; biological activity; human health; performance evaluation; product stability; food storage; enzyme inhibitors; reductases; oxygen; controlled atmosphere storage
Summary: Fruits and vegetables contain a diversity of phytonutrient compounds that contribute to food quality and overall human health. Improving overall quality phytonutrient content in fruits and vegetables may increase marketable characteristics to U.S. consumers. This project will explore phytochemical compounds in commodities important to the economy of Florida and explore chemical isolates from these crops for antioxidant properties.
Progress: Polyphenolics were characterized in eight muscadine (Vitis rotundifolia) cultivars and evaluated for AOX as influenced by ripening and location in the fruit (skin, pulp and juice). Polyphenolics increased as fruit ripened and the highest concentrations were located in the skins. Free

ellagic, ellagic acid glycosides, and total ellagic acid ranged from 8-162, 7-115, and 587-1900 mg/kg respectively in the skin of ripe grapes. Little information exists on synergistic or antagonistic biochemical interactions in fruits and vegetables. Studies to investigate interactions between quercetin and ellagic acid showed these compounds acted synergistically (at 10 mmol/L each) in the reduction of proliferation and viability, in the induction of apoptosis and the alteration of cell cycle kinetics. Anthocyanins and polyphenolics present in the pulp of acai (Euterpe oleracea Mart.) were determined and their contribution to antioxidant capacity and anthocyanin functional properties established. Color stability against hydrogen peroxide over a range of temperatures was determined and compared to those from various other sources. Polyphenolic content, antioxidant capacity, and relative pigment stability of acai fruit were established for the first time under a diversity of storage conditions. Stability of red grape anthocyanins (Vitis vinifera) in a model juice system during normal and accelerated storage was evaluated in the presence of ascorbic acid. Rosemary polyphenolic cofactors were evaluated as stabilizing agents. Compounds followed first order degradation kinetics during storage. Copigmented treatments underwent a lower conversion of L-ascorbic acid into dehydroascorbic acid during storage when compared to the control favorably impacting the vitamin content of these models. The effect of PPO activity on phytochemical stability of an ascorbic acid fortified muscadine grape juice following high pressure processing and storage was investigated. Rosemary and thyme polyphenolic cofactors were evaluated as anthocyanin-stabilizing agents. PPO activity increased following HHP and the addition of cofactors not only increased color and antioxidant activity but also reduced phytonutrient losses created by the highly oxidative conditions that resulted from HHP. Greenhouse-grown bell peppers (Capsicum annuum, cv. Robusta) were harvested from early and late season plants and subsequently stored at 20C in a continuous-flow chamber consisting of either 100 mL/L ethylene (balance air) or air-only (control) at 90% relative humidity (RH). Exposure to ethylene hastened ripening time compared to the air control but was independent of fruit maturity at harvest. Differences in phytochemical concentrations between harvest times were attributed to environmental factors such as average temperature day length and light intensity. Yaupon holly (Ilex Vomitoria) were investigated by HPLC for concentrations of alkaloids and antioxidant cinnamic acid derivates. Fertilized samples produced higher concentrations with females responding more to fertilization than males.
Impacts: Information on phytochemical content, stability, antioxidant capacity, and quality of various plant-based systems was evaluated. By monitoring these factors in food and biological systems, a better understanding of food quality and potential health promoting properties were assessed.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FOS-04098
Title: ***OPTIMIZING HEALTH WITH FOLATE AND RELATED NUTRIENTS THROUGHOUT THE LIFESPAN***
Critical Needs:
National Goals: 3
Key Themes: folic acid; vitamin b12; polymorphism; genetics; neural tube defects; homocysteine; life span; folates; nervous system; birth defects; cardiovascular diseases; dna; methylation; methionine; synthetases; reductases; human nutrition; human health; nutrient requirements; nutrient disease relations; nutrient intake; carbon metabolism; nutrient status; chronic diseases; risk; cancer; cognition
Summary: Folate is a vitamin with important health implications. Impaired folate status has been associated with increased risk for birth defects, vascular disease, cancer, and cognitive dysfunction. Studying the relationship between folate status, genetic make-up and chronic disease risk may provide clues for improving human health that can be translated into nutrition education programs for the public.
Progress: Impaired folate status has been associated with increased risk for neural tube defect-affected pregnancies among women of childbearing age (18-45 years) and for conditions that may negatively affect the health of the aging population such as vascular disease, cancer, and cognitive dysfunction. We have determined the C677T and A1298C methlenetetrahydrofolate reductase (MTHFR) and the A66G methionine synthase (MTRR) genotypes for approximately 350 women and measured their folate and

vitamin B12 status. Measurement of the plasma homocysteine concentration for these subjects is nearing completion. These polymorphisms may act in concert with each other and with nutritional deficiencies to alter metabolism unfavorably and thereby increase disease risk, including the risk for neural tube defects (NTDs). We also have examined the relationship between markers of DNA stability, other folate status indicators, and C677T MTHFR genotype under the conditions of folate depletion and repletion. Our data suggest that the C677T MTHFR polymorphism negatively affects folate and homocysteine response in young women consuming moderately low folate diets followed by folate repletion with the RDA and that folate depletion may result in a reduction in global DNA methylation. Compared to women with the 677 MTHFR CC genotype, women with the TT genotype appear to respond more positively to folate repletion. In a separate internationally based project, the impact of a folic acid fortification program on folate status response indicators in women of reproductive age was evaluated. This project, which was conducted in Chile, showed that folate status improved substantially in this population group in response to fortification. Finally, 2 research-based, multimedia nutrition education programs for 4H youth (10 to 12 y and 13 to 16 y) were created, pilot tested, and distributed to 4H programs throughout the state of Florida. The goal of both programs is to improve nutrition-related knowledge and health practices of young males and females with regard to the benefits of making healthy food choices, increasing physical activity and ensuring adequate folate/folic acid intake.

Impacts: Determining the impact of folic acid fortification of enriched grains and cereals on folate status response indicators and birth defect/chronic disease risk, and understanding the relationship between folate and vitamin B12 status/intake, common genetic variations, and altered metabolic function will help to better define optimal nutrient requirements for target populations. In conjunction with the development and testing of educational programs designed to motivate consumers to adopt dietary behaviors associated with risk reduction, our research program has the potential to reduce health care costs, morbidity, and premature death. The long term economic impact of this research could be significant in a state like Florida where vascular disease, cancer, stroke, and Alzheimer's disease, respectively, represent the first, second, third, and eighth leading causes of death.

Source of Federal Funds: Hatch

Scope: State

Project Number: FLA-FRE-03571

Title: ***DYNAMIC ECONOMIC ANALYSIS OF THE FLORIDA CITRUS INDUSTRY***

Critical Needs:

National Goals: 2

Key Themes: economics; citrus; agricultural economics; economic analysis; fruit; world trade; marketing systems; production systems; international competition; investments; marketing strategies; policy analysis; simulation models; cash flow; spatial equilibrium; foreign markets; supply and demand; econometrics

Summary: 1. Supplement existing work with secondary data and primary data collection. 2. Develop simulation models of cash flow using standard techniques. 3. Develop spatial equilibrium models of world markets for citrus products; estimate supply and demand equations for citrus products using econometric techniques. 4. The models developed under objectives 2 and 3 will be used to analyze policy issues via both deterministic and stochastic simulation techniques.

Progress: Research encompassed four areas related to the Florida citrus industry: the likely impact of passage of FTAA and elimination of the U.S. orange juice tariff, possible economic implications of citrus canker, potential of the Cuban citrus industry, and NAFTA and its impact of the citrus industries of Mexico and Florida. Elimination of the U.S. orange juice tariff would have a significant impact on Florida orange growers. Delivered-in prices are projected to decline by $.20 per pound solid which translates to decreased grower prices of $1.20 to $1.40 per 90 pound box. Preliminary work suggest the citrus canker would both decrease per acre yields and increase grower costs, hence lowering grower returns. Cuba continues to struggle in competing in world markets for fresh grapefruit. It continues to send most of its

fruit to the processing sector. Mexico has not yet been able to advantage of increased access to the U.S. market under NAFTA. Its citrus industry remains highly fragmented.
Impacts: Citrus continues to be the largest agricultural industry in Florida and Florida is the second largest citrus producing region in the world. Understanding of the impact of proposed trade agreements and the competitive position of Florida's competitors will assist Florida growers in decisions regarding expansion or contraction of production.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-FRE-03584
Title: ***PRIVATE STRATEGIES, PUBLIC POLICIES, AND FOOD SYSTEM PERFORMANCE***
Critical Needs:
National Goals: 5
Key Themes: economics; food economics; economic analysis; public policies; food safety; food nutritive value; human nutrition; food quality; consumer surveys; perceptions; public attitudes; risk assessment; risk management; consumer behavior; food contamination; microbial pathogens; statistical analysis; meat
Summary: Provide economic analysis of food safety issues. Measure consumer perceptions of foodborne illness and personal risk management strategies to avoid foodborne illness.
Progress: Public concern about pesticide residues in food has placed pressure on agricultural producers and processors to reduce pesticide residues. This pressure impacts firms through the risks and costs of failing to meet government regulatory standards. It presents new opportunities for product differentiation on the basis of safer food. Firms may react to uncertainty about input quality by seeking to increase the mean level and reduce the variance of that quality. In the case of pesticide residues, this implies efforts to reduce the mean level and variance of pesticide residues in inputs. This article analyzes data on pesticide residues and the occurrence of vertical integration from a sample of Florida strawberry and tomato growers. The hypothesis tested is that products sampled from vertically integrated firms will have lower mean levels and variances of pesticide residues. Vertical integration was associated with significantly less varied fungicide and insecticide residues from Florida strawberry growers. This means that the strawberries coming from vertically integrated strawberry growers are a more uniform quality than those from non-vertically integrated growers. Furthermore, the strawberries from vertically integrated strawberry growers are of higher quality because fungicide residue levels are, on average, lower than those from non-vertically integrated growers. In contrast, vertical integration appears to be significantly associated with more varied fungicide residues in tomatoes; however, insecticide residue levels are less varied and more uniform in tomatoes. This study represents the first known attempt to quantify the relationship between food safety and vertical coordination in agricultural markets. The results confirm the positive relationship hypothesized in the growing number of qualitative studies in this area, at least for the case of fungicide and insecticide residues in Florida strawberries and the insecticide residues in Florida tomatoes. Some of the limitations of this study suggest important topics for further research. In particular, a similar study using data collected randomly would allow implications to be drawn for a broader population. In addition, information about the weightings assigned by firms to their various product quality objectives would allow the effects of conflicting objectives to be identified. Finally, further evidence of a negative relationship between vertical coordination and pesticide residues in food may suggest important market-based targets for government policies aimed at improving food safety. These may include measures to improve information transfer at all levels of the market through unified grading and labelling standards, improved information technology and more accurate and less expensive testing mechanisms, and government standards in product tracking from producer to processor to retailer.
Impacts: Further evidence of a negative relationship between vertical coordination and pesticide residues in food may suggest important market-based targets for government policies aimed at improving food safety. These may include measures to improve information transfer at all levels of the market through unified grading and labelling standards, improved information technology and more accurate and less

expensive testing mechanisms, and government standards in product tracking from producer to processor to retailer.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FRE-03597
Title: ***FACTORS AFFECTING THE COST OF CAPITAL IN RURAL COMMUNITIES: CHANGING COMPETITION AND REGULATIONS***
Critical Needs:
National Goals: 2
Key Themes: economics; rural communities; credit; government regulations; technological change; policy analysis; structural analysis; consumer demand; agricultural production; market competition; cost functions; capital; econometrics; banks; rural institutions
Summary: To accomplish objectives, this study will use econometric techniques to estimate multiproduct cost functions for rural banks and the demand for credit by production agriculture.
Progress: This study examined the possibility for imperfect competition in the agricultural capital market using an econometric approach to test for monopolistic pricing. In general, the study was hindered by data and concavity problems in the banking data. Much of the research focused on the estimation of system of equations with missing data.
Impacts: This research project has spawned additional research into nonparametric methodologies that can be used in the estimation of market clearing conditions under missing data. Specifically, following the work of a graduate student, several ongoing efforts exists in imputation procedures for missing data, estimation using entropy approaches, and nonparametric and semiparametric approaches in cost functions.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FRE-03599
Title: ***THE EFFECT OF FARMLAND BOOM/BUST CYCLES ON THE RURAL ECONOMY***

Critical Needs:
National Goals: 1, 2, 5
Key Themes: economics; land; farm land; rural communities; land values; market structure; value changes; price fluctuations; interest rates; government policies; returns; economic security; assets; community economy; wealth; multipliers
Summary: Farmland values in United States have experienced frequent boom/bust cycles. These cycles have significant implications for rural communities and institutions. This research develops an empirical model of farmland boom/bust cycles and links these cycles to economic cycles in rural communities.
Progress: Most of the work this year centered around the interaction between land values, urban sprawl and productivity. This work was presented in an organized symposium at the AAEA meetings in July and at a meeting of the UNECE, OECD and FAO in Geneva in October. In addition, we received funding for a conference on farmland values that will be held in Washington, DC on May 6, 2002. We are currently in the process contacting the speakers and finalizing the program.
Impacts: No Impact
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-FRE-03660
Title: ***FOOD DEMAND, NUTRITION AND CONSUMER BEHAVIOR***
Critical Needs:

National Goals: 5
Key Themes: human nutrition; economics; consumer behavior; consumer demand; consumer awareness; consumer attitudes; human health; diets; food nutritive value; food programs; economic analysis; social economics; food consumption surveys; low income consumers; household consumers
Summary: A levels version of the Rotterdam demand system will be used to incorporate nutrients as price deflators using the 1987-88 National Food Consumption Survey (NFCS) data. The study will focus on low income household food consumption. A household production model will be used to analyze the implicit values of nutrients in U.S. household food consumption. The 1987-88 NFCS data will be used to estimate the implicit values and the impacts of household composition on the demand for nutrients.
Progress: Our primary involvement in the demand estimation this year involved extending the Florida Model of demand from a cross-sectional model to a time-series model. Next, we intend to estimate this model using informational fitting.
Impacts: No Impacts
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FRE-03701

Title: ***AGRICULTURAL AND FOOD PRODUCT LOGISTICS: IMPLICATIONS FOR FLORIDA AND THE U.S. IN A WORLD MARKET***

Critical Needs:
National Goals: 1
Key Themes: produce; logistics; eastern europe; regional research; trade agreements; food marketing; market analysis; economic analysis; agricultural economics; international trade; transportation; united states; canada; latin america; legal aspects; refrigeration; food storage; perishable foods; marketing systems; economic potential; economic impact; costs; rail transportation; truck transportation; trucking; demography; workers; data collection
Summary: It is crucial for Florida and U.S. agricultural and food industries to have up-to-date knowledge about developments in logistics. In the project will be examined the implications of technological and institutional changes on the ability of Florida and other U.S. producers of perishables to compete in domestic and foreign markets, with particular attention on current and potential competition from Latin America and potential markets for Florida products in Eastern Europe and the Former Soviet Union.
Progress: In the project's second year the investigation was completed of the impacts of NAFTA on produce shipments in the United States. The results indicate that NAFTA's effects have been negligible. While the large southern tier U.S. produce producing states (i.e., FL, TX, AZ, and CA) have lost market share, only a quarter of these losses have been to the benefit of Mexico. In addition, over 90 percent of the variation in Mexico's shipments into the U.S. can be explained by exchange rates, while there are no apparent effects from NAFTA. Using a large survey of drivers of long distance refrigerated trucks, the extent to which schedules encourage violations of hours-of-service regulations and/or speed limits was investigated. The results indicate that schedules have compensated for increases in speed limits since the early 1990s. Drivers today are as, if not more, likely to have violation-inducing schedules as they were a decade before. Work was also completed on a study of the structure of the trucking industry serving Florida's ornamental industry. The results suggest that changes in concentration levels in this never-regulated industry have been similar to segments of trucking which experienced deregulation. This indicates that concentration changes in the latter may not have been due or due primarily to deregulation. Work in progress is investigating driver supply. Despite widespread beliefs to the contrary, preliminary results indicate general satisfaction with work conditions and pay rates. This suggests that fears about a looming driver shortage may be overstated.

Impacts: The project will help determine the extent and impacts of changes within the transport sector serving Florida agriculture. Many areas of this work, such as the work on NAFTA, safety, driver supply, and industry structure, have implications for the nation as a whole.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FRE-03863
Title: ***THE EFFICIENCY OF ALTERNATIVE NATURAL RESOURCE AND ENVIRONMENTAL POLICIES AND PRACTICES***
Critical Needs:
National Goals: 1, 4, 5
Key Themes: econometric models; economic impact; environmental impact; economic analysis; fisheries; regional research; marine fish; optimization; resource management; renewable resources; rent; public policies; management alternatives; environmental quality; data collection; resource utilization; social impact; comparative analysis; information collection; feasibility; short term; policy analysis; cost benefit analysis; incentives; decision making; value determination; willingness to pay; prices; linear programming; non linear programming
Summary: Florida's natural resources and environmental quality are subject to potential overuse and degredation. Proposed resource management and environmental policies often neglect indirect benefits from potentially harmful and irreversible practices. This project examines the economic efficiency of resource and environmental policies. The purpose of this study is to develop methodologies, data, and quantitative economic information on policies for managing natural resources or environmental quality.
Progress: Several natural resource and environmental issues were considered in 2003 in order to address all three project objectives. The research pertained to the Southeast U.S. commercial shark fishy (effort assessment and valuation), Southeast U.S. precision cotton farming (determination of factors affecting observed environmental improvements), modeling of optimal fee structures using bioeconomic models (estimation of price and cost functions in a small squid fishery), and ecolabeling in fisheries (i.e., characteristics of certified fisheries). In addition, several manuscripts from previous work on this project were published during this year. One new research project (grant-funded) was initiated during this period. It involves assessing the fair market value of commercial shark permit holders in the Gulf of Mexico and South Atlantic regions. This project is timely since several effort buyback programs for commercial fisheries are being proposed. The key issue underlying the establishment of these programs is the total cost, which depends on the value of the permit and/or vessel. Given that the shark fishery in question involves vessels that routinely harvest several other species, the valuation question is complicated. Since, at this time, there is no standardized methodology for determining what is the fair market value in the context of a fisheries effort buyback program, this project has wide potential application. Progress on this project has involved bringing in a speaker for the J. Wayne Reitz seminar series and attempting to obtain records of fishing behavior for permitted individuals in all fisheries. In addition, an Invited Paper session was proposed and accepted by the Southern Agricultural Economics Association. The grant-funded project initiated last year involving the development of a bioeconomic model to evaluate optimal licensing fee systems was formally approved in 2003. Work to date has involved evaluating the available biological information and estimating vessel-level cost functions and hedonic price functions. Two continuing grant-funded projects were also advanced during this period. Under the first, the probability of observing environmental benefits from the use of precision farming was estimated as a function of various farm and farmer characteristics and production behaviors. Under the second, the characteristics of fisheries that have obtained the Marine Stewardship Councils environmental certification for seafood were summarized and use to identify commonalities among fisheries.
Impacts: For the marine ornamental industry, results can help harvesters develop marketing plans and decide whether to become ecolabeled. For the squid fishery, results from the cost and price functions can aid the government in assessing the feasibility of fees by vessel size and aid harvesters in size targeting strategies. For cham scallops, results predict optimal harvesting by region, production method, and week

that government and harvesters can benefit from. Since aquaculture is increasing, and cham scallops are valuable, these results have broad applicability. Portfolio theory was used to examine optimal product diversification at the harvest and processing levels. Aside from direct benefits to harvesters and processors, results also suggest profitable changes to resource management plans. Theoretical work on the economic benefits of considering intrinsic fish quality is applicable to finfish fisheries characterized by variable quality at the time of harvest. The blue crab workshops revealed preferences for future management, which can aid managers in establishing regulations that have industry support. Building consensus prior to the establishment of regulations can expedite regulations to protect overfished and or overcapitalized fisheries. Examination of factors affecting whether environmental improvements from precision farming have been observed has the potential to increase future improvements through educational efforts.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FRE-04005

Title: ***CONSUMER ATTITUDES AND PREFERENCES REGARDING FLORIDA AGRICULTURAL PRODUCTS.***

Critical Needs:
National Goals: 1, 5
Key Themes: consumer demand; perceptions; methodology; consumer attitudes; consumer preferences; agricultural commodities; econometrics; information collection; food marketing; food consumption; food safety; extension; information dissemination; focus groups; consumer surveys; data collection; decision making; biotechnology; agribusiness; willingness to pay; incentives; value determination; econometric models; data analysis
Summary: Understanding more about the factors that influence consumers' subjective perceptions about food consumption will allow agribusinesses, agricultural producers, and policy makers to respond more effectively to consumer concerns. This project is designed to improve our understanding of the effects of consumer tastes and preferences, including food safety, on Florida agriculture.
Progress: A number of studies are underway examining consumer tastes and preferences for agricultural products in both Florida and the United States. One survey was administered gathering information on consumer preferences for seafood products and another was administered focusing on identifying the determinants of consumer acceptance of genetically modified foods. The work on genetically modified foods is part of a team project with two other U.S. institutions and a group in Europe based out of the University of Reading. Data from these surveys is currently being compiled and preliminary results have been presented at a number of professional meetings. Several papers are in review (or accepted) in peer-reviewed journals and have been presented at professional meetings.
Impacts: The research examining consumer perceptions of genetically modified foods has had a significant impact in a number of arenas. Consumer perceptions of varying types of genetically modified foods have important implications for public policy and marketing of agricultural commodities. Our research is beginning to address some of the important questions posed by policy makers and the biotechnology industry, potentially making future policy and marketing campaigns more effective. The research on consumer opinions of seafood is important because it can provide information to the growing seafood industry on how to target specific market segments.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FTL-03539

Title: ***THE INFLUENCE OF EDAPHIC FACTORS ON GROWTH OF TORPEDOGRASS, MAIDENCANE, AND HYGROPHILA AND THEIR RES***

Critical Needs:
National Goals: 1, 4
Key Themes: weeds; plant ecology; aquatic plants; hydrilla; plant communities; edaphic factors; weed control; population dynamics; panicum; biological control (weeds); plant competition; native plants; exotic plants; irrigation canals; aquatic weeds; sediments; nutrient levels; grasses; herbicides
Summary: Torpedograss and hygrophila are two exotic plant causing major problems in aquatic systems in Florida. Maidencane, a native plant closely resembling Torpedograss, is being desplaced by torpedograss and the emerged growth form of hygrophila. This project will examine edaphic factors related to growth and development of torpedograss, hygrophila, and maidencane.
Progress: Torpedograss is a major weed problem in shoreline and wetland areas. Control of torpedograss is essential for establishment and growth of native emerged aquatic plants in mitigation and restoration projects. Torpedograss can take advantage of a variety of nutrient conditions in the sediments, and grow at the expense of native plants. Torpedograss is not considered an obligate wetland species, but will establish and grow under conditions similar to that for Maidencane, a native wetland grass. Hygrophila grows best at high sediment nutrient levels, and control of emerged plants along the shoreline is essential in helping to prevent establishment of submerged plants.
Impacts: This project showed that control of Torpedograss and Hygrophila is essential to allow for growth of Florida's native aquatic plants. Both of these exotic plants will grow as monocultures crowding and eliminating growth of native species. Most native species require low sediment nutrients for optimum growth. Because Torpedograss will grow under high and low nutrients in the sediments, this grass removes nutrient resources required for growth of native species. Hygrophila on the other hand prefers to grow in soils with high amounts of nutrients. Surveys for nutrients in the sediments may help in determining locations where Hygrophila problems may occur.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FTL-03602

Title: ***TAXONOMY AND BIOSYSTEMATICS OF CULTIVATED PLANTS***

Critical Needs:
National Goals: 1
Key Themes: plant taxonomy; biosystematics; cultivated plants; plant identification; wild plants; classification systems; euphorbiaceae; plant propagation; plant introductions; conservation; endangered plants; plant anatomy; plant morphology; electrophoresis; chromosome number; microscopy
Summary: The Florida nursery industry relies on the biodiversity of compatible floras worldwide. Understanding the biological relationships of important cultivated plant groups is thus extremely important and has immediate applications to future crop improvement through selection and breeding. The purpose of this project is to elucidate the taxonomic and other biological relationships of useful ornamental plants. Particular focus is on the monocot familes Amaryllidaceae and Alstroemeriaceae, both important sources of cutflower and garden herbaceous perennials.
Progress: Three plastid DNA sequences were analyzed for a broad sampling of Amaryllidaceae to resolve the American genera of the Amaryllidaceae as a clade that is sister to the Eurasian genera of the family, but base substitution rates for these genes are too low to resolve much of the intergeneric relationships within the American clade. We obtained ITS rDNA sequences for 76 species of American Amaryllidaceae and analyzed the aligned matrix cladistically, both with and without gaps included, using two species of Pancratium as outgroup taxa. ITS resolves two moderately to strongly supported groups, an Andean tetraploid clade, and a primarily extra-Andean hippeastroid clade. Within the hippeastroid clade, the tribe Griffineae is resolved as sister to the rest of Hippeastreae. The genera Rhodophiala and Zephyranthes are resolved as polyphyletic, but the possibility of reticulation within this clade argues

against any re-arrangement of these genera without further investigation. Within the Andean subclade, Eustephieae resolves as sister to all other tribes; a distinct petiolate-leafed group is resolved, combining the tribe Eucharideae and the petiolate Stenomesseae; and a distinct Hymenocallideae is supported. These Andean clades are all at least partially supported by plastid sequence data as well. We infer from our data that a great deal of the diversity of the family in the Americas is recent, and that the American Amaryllidaceae may have been reduced to peripheral isolates some time after its initial entry and spread through the Americas. While the sister relationship of the American and Eurasian clades might argue for a Boreotropical origin for the family in America, the cladistic relationships within the American clade based on ITS do not provide any further support for this or any other hypothesis of the entry of this family into America. The new tribe Clinantheae is described (four genera: Clinanthus, Pamianthe, Paramongaia and Pucara), and the lorate-leafed species of Stenomesson are transferred to Clinanthus.
Impacts: Better understanding of the phylogenetic relationships of the flowers represented by the lily plant families.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FTL-03607

Title: ***BIONOMICS AND MANAGEMENT OF HEMIPTEROUS PESTS OF WOODY ORNAMENTAL PLANTS AND TURFGRASSES IN FLORIDA***

Critical Needs:
National Goals: 1, 5
Key Themes: insects; insect control; woody ornamentals; plant insect relations; turf grasses; bionomics; hemiptera; homoptera; cycads; toumeyella; myndus crudus; palmae; insect biology; field studies; cycads
Summary: Insect species in the order Hemiptera that are important pests of woody ornamental plants and turfgrass in southern Florida will be studied in the field to obtain biological data of importance in developing pest management strategies for them.
Progress: More than 150 species of woody plants were identified as hosts of the lobate lac scale insect, Paratachardina lobata (Hemiptera: Coccoidea: Kerriidae), an exotic pest found in southern Florida in 1999. Development time from settled first instar to adult was 4 months (April-July) [RWP1]. First instars survived for 2 weeks without a host. There are two larval instars; the third development stage is the mature female. Males of P. lobata apparently do not occur in Florida. In studies of temperature relationships, first instars did not survive at minus 1 degree Celsius for 2 hours. Some adults survived at minus 2 degrees Celsius for 2 hours. Two species of Encyrtidae (Hymenoptera), viz., Metaphycus sp. and Ammonoencyrtus sp., were reared from field-collected lobate lac scales; less than 1 percent of lobate lac scale insects were parasitized. Imidacloprid in a root drench at 3 rates (AI), 0.56, 0.28, and 0.14 g per cm of dbh, nearly eliminated infestations of the scale on large (ca 75 cm dbh) Ficus microcarpa trees within three months after treatments. Rearing techniques were developed for colonies of lobate lac scale for biological control research. The bionomics of Aulacaspis yasumatsui (Hemiptera: Coccoidea: Diaspididae) were elucidated. This scale insect lives exclusively on Cycadales, and shows a marked preference of species of Cycas. It has the unusual characteristic of infesting roots in addition to aboveground parts of its hosts. This scale insect was effectively controlled with foliar sprays of a fish oil product mixed with any of several insecticides, including malathion, carbaryl or bendiocarb, or with malathion or carbaryl mixed with water and an emulsifier. Immersion of the root ball of containerized cycads in an emulsion of paraffin-based horticultural oil and water for a few minutes, or in water for three days, resulted in almost 100 percent control of A. yasumatsui on the roots, with no adverse effects on the plant. A single root drench of royal palms, Roystonea regia (Palmae), with imidacloprid prevented damage by the royal palm bug, Xylastodoris luteolus (Hemiptera: Heteroptera: Thaumastocoridae) for two spring seasons. Myndus crudus (Hemiptera: Auchenorrhyncha: Cixiidae), is a vector of lethal yellowing of palms whose larvae develop on roots of grasses. It was shown that dicotyledonous ground-

covers did not support the development of this insect. Plants shown to be non-hosts included Pueraria phaseoloides and Arachis pintoi (Leguminosae); these are widely used as ground-cover in palm plantations. Adults of various species of Derbidae (Hemiptera: Auchenorrhyncha) are widely distributed on palms in warm regions. It was shown that the larvae of a palmivorous derbid, Cedusa inflata, develop in decaying palm debris, and population levels of this insect on palms were related to the distance of the palm from heaps of decaying vegetation.
Impacts: The knowledge of bionomics of Myndus crudus and Cedusa inflata (Auchenorrhyncha), Aulacaspis yasumatsui and Paratachardina lobata (Coccoidea) generated in this project is useful as a basis for developing and improving pest management practices for these and related insect pests. The chemical treatments developed in this project for several hemipterous pests of ornamental plants will provide effective control of these pests in nurseries and landscaped areas.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-FTL-03609

Title: ***INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS***

Critical Needs:
National Goals: 1
Key Themes: ornamental plants; floriculture; plant introductions; plant evaluation; new varieties; nursery stock; woody ornamentals; landscape plants; potted plants; foliage plants; cut flowers; cultural practices; information collection; drought tolerance; plant resistance; information dissemination; cold hardiness; fertilizer requirements
Summary: The nursery industry is constantly looking for new plant materials to add to their product mix. The purpose of this project is to import, evaluate, and work out production methods for new ornamental horticultural crops.
Progress: No work was done on this project in 2002
Impacts: Malayan Dwarf and Maypan coconuts have been widely planted throughout south Florida and the Caribbean region because of their supposed resistance to lethal yellowing, but this study shows that they are not resistant to this diease. The Fiji Dwarf, however, may be.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FTL-03620
Title: ***WEED BIOLOGY AND CONTROL FOR TURFGRASS AND THE LANDSCAPE***
Critical Needs:
National Goals: 1
Key Themes: weeds; grasses; turf grasses; weed control; landscape management; plant competition; plant communities; plant ecology; herbicides; biological control (weeds); growth regulators; integrated pest management; golf courses; lawns; cynodon; stenotaphrum; paspalum; eremochloa; plant taxonomy; plant genetics
Summary: Controlling weeds in Florida turf costs $90 million each year. Yet weeds damage public easements, lawns, and recreation areas, and cost urban people in health, safety, and removal. Weeds cause human allergy, traffic accidents, and loss of use and reduction of property values. This study seeks environmentally sound ways to manage urban weeds, especially weeds of golf courses, sod, and home lawns.
Progress: Phenoxy herbicides were evaluated as alternatives to atrazine for postemergence broadleaf weed control in St. Augustinegrass (Stenotaphrum secundatum) lawns and sod. Phytotoxicity varied greatly among formulations, for example, 2.2 kg/ha acid equivalent 2,4-D as dimethylamine formulation caused only 19% injury to St. Augustinegrass, whereas 0.7 kg/ha 2,4-D as 2-ethylhexyl ester caused 60%

injury. MCPA and mecoprop were very harmful to St. Augustinegrass individually and in mixtures. Carfentrazone-ethyl + phenoxy herbicide mixtures controlled dollarweed (Hydrocotyle umbellata) more effectively and more quickly than atrazine, clopyralid, or metsulfuron in turf field plots. The potential injury to subtropical landscape plants caused by volatile turf herbicides was evaluated in polyethylene enclosures. The most sensitive species were African marigold (Tagetes erecta), Joseph's coat (Alternanthera ficoidea), and tomato (Lycopersicon esculentum). Severe injury (epinasty of stems and petioles, marginal leaf curling, stem swelling, root proliferation, discoloration of leaf or stem and flower drop) was caused by exposure to herbicides containing 2,4-D isooctyl ester and MCPA isooctyl ester. Exposure to individual active ingredients 2,4-D dimethylamine, dicamba acid, atrazine, and metsulfuron resulted in no injury to the species tested. Postemergence control of tropical signalgrass (Urocholoa subquadripara) was evaluated using asulam, diclofop-methyl, ethofumesate, metribuzin, MSMA, quinclorac, and trifloxysulfuron, and preemergence control with atrazine, dithiopyr, metolachlor, oryzalin, oxadiazon, pendimethalin, and prodiamine. Only MSMA at 2.5 kg/ha in two to four applications was effective in postemergence control, and could only be used in bermudagrass (Cynodon spp.) turf. Among preemergence herbicides, tropical signalgrass seedlings were controlled best by oxadiazon at 2.3 kg/ha and pendimethalin at 3.4 kg/ha, but the most effective herbicide, oxadiazon, resulted in 27 seedlings/sq m, compared with 100 seedlings/sq m for untreated. Field experiments were conducted on the reduction of torpedograss canopy by multiple split applications of quinclorac applied postemergence to bermudagrass golf course roughs in Florida. The most effective treatment, 0.42 kg/ha quinclorac applied four times each year for two years, reduced torpedograss canopy from 10%, compared with 86% torpedograss canopy in untreated plots, and reduced torpedograss dry wt to 1,570 kg/ha, compared with 8,010 kg/ha in untreated plots. Following two years of reapplication with the commercially labeled treatment, quinclorac at 0.84 kg/ha applied twice per year, torpedograss canopy was reduced to 45% and dry wt to 4,640 kg/ha. Visual evaluation of canopy was too optimistic in representing the herbicidal control of torpedograss by quinclorac, as torpedograss regrew from rhizomes, and canopy was a relatively small part of the plant. In plots not chemically treated, pachymorph rhizomes were 63%, leptomorph rhizomes were 24%, and leaves were only 13% of the total dry wt of torpedograss.

Impacts: Biology can help make herbicide applications more effective. Reduced rates of quinclorac applied multiple times control torpedograss better than the current label with higher application rates applied fewer times. Torpedograss has an extremely dense biomass reserve in the form of "pachymorph" rhizomes, from which it regrows. The development of carfentrazone phenoxy mixtures led to mixtures too phytoxic for use on St. Augustinegrass. It was shown from the active ingredients that the problem could be explained by the inclusion of the ethylhexyl (isooctyl) ester of 2,4-D, which was very harmful to Augustinegrass. Tropical signalgrass was identified as a difficult weed in both bermudagrass and St. Augustinegrass turf. Interestingly, oxadiazon and pendimethalin, normally preemergence herbicides, were discovered to have sufficient postemergence effect on tropical signalgrass seedlings that they more effectively controlled the seedlings when applied 8 d after plug planting on a sod farm, versus 1 d after. The most serious weeds of bermudagrass turf in South Florida were (in order of seriousness): goosegrass, torpedograss, crabgrasses, tropical signalgrass, and off-type bermudagrass. Based on four surveys of golf and sports turf managers in south Florida, the five top weeds represented 74% of the weighted seriousness values of bermudagrass turf weeds. Other weeds ranked in the "Top Ten" in seriousness were crowfootgrass, green kyllinga, dollarweed, spurge, and Poa annua. Weed research will be continued in project FLA-FTL-04066, "Environmental management of weeds in Turfgrass."

Source of Federal Funds: Hatch

Scope: State

Project Number: FLA-FTL-03711

Title: ***TURFGRASS FERTILITY MANAGEMENT AND ENVIRONMENTAL IMPACT***

Critical Needs:

National Goals: 1, 4
Key Themes: turf grasses; fertilization; lawns; runoff; leaching; nitrogen; phosphorus; golf courses; fields; sports; program evaluation; performance evaluation; application rate; systems development; lysimeters; water samples; application methods; application intervals; cultural practices; surface properties; pollution control
Summary: N and P are essential for healthy turfgrasses. However, the fertilization must minimize N and P losses in runoff waters. The project is designed to identify techniques that minimize nutrient losses in runoff waters from golf and home lawns, and to identify practices that promote playable sports turf. This project examines the effectiveness of fertilizer application techniques, sources, rates, and irrigation to reduce N and P in runoff waters.
Progress: Turfgrass management has been implicated as a potential source of N pollution in hydrologically linked watersheds. Two projects were conducted to determine N leaching from turfgrass systems. In one project, 2 N rates (15 and 30 g N/m-2), 6 N sources (no fertilizer, urea, and 4 combinations of urea with IBDU or SCU), and two irrigation rates (fixed or adjusted) were examined to determine their effect on N leaching from St. Augustinegrass. The fixed irrigation is considered the high rate of irrigation, equaling 125% ET adjusted on a monthly basis. The adjusted irrigation is to irrigate upon visual plant stress. This test was performed on grass grown on soil with either 4 or 8% organic matter. There was an increased amount on N leaching from the sod grown in on the soil with higher OM. N leaching increased with N rate. N leaching was greater from turf receiving the fixed irrigation only during the rainy season. In the second experiment, N leaching from two mature contrasting landscapes were compared (St. Augustinegrass vs. a mixed-species ornamentals landscape). The mixed-species ornamentals landscape was maintained with no fertilization, while the St. Augustinegrass was fertilized at the current IFAS recommended rate. Both landscapes were only watered upon visual plant stress. N leaching from both the landscapes decreased from the previous year, however there was more N leaching from the mixed-species ornamental landscape. While irrigation had to be applied to each landscape at times of water stress, the mixed-species ornamental landscape required more irrigation to recover from water stress.
Impacts: The experiments are being conducted to quantify the environmental impact from turfgrass management, especially nitrogen. The results will provide a basis for BMPs to minimize potential N leaching from management of turfgrass systems.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-FTL-03754

Title: ***COCONUT LETHAL YELLOWING AND RELATED DISEASES***

Critical Needs:
National Goals: 1, 4
Key Themes: plant disease control; plant genetics; plant microbiology; virus diseases (plants); lethal yellowing (cocos); coconuts; epidemiology; disease detection; polymerase chain reaction; disease diagnosis; phylogeny; plant pathology; disease prevention; mortality; tropical agriculture; host range; insect vectors; disease vectors; plant pathogen relations; genetic variance; plant disease resistance; gene expression
Summary: Lethal yellowing is a fast-spreading, fatal disease of coconut and other palms and limits palm production because it is incurable at present The purpose of this study is to learn more about lethal yellowing epidemiology and to devise practical disease management strategies
Progress: Spread of coconut lethal yellowing (LY) disease continues among coconut palm populations along the Atlantic coast of Central America. In addition to southern Mexico, Belize and Honduras, presence of LY was most recently confirmed in Guatemala. LY-type diseases were also identified for the first time affecting coconut production in the states of Guerrero and Oaxaca on the Pacific coast of

Mexico and were also responsible for a fatal decline of mature, ornamental Canary Island date palms in Corpus Christi, Texas. Characterization by phylogenetic analysis of 16S rRNA gene sequences PCR-amplified from phytoplasmas determined that the associated strains detected in dying palms in southwestern Mexico differed from those strains infecting Texas Phoenix palms. Collectively, strains at both locations were very similar to, albeit distinct from, the LY agent and were classified subsequently as new members of the coconut lethal yellows (16SrIV) phytoplasma group. These findings provide important insights into strain variation among LY group phytoplasmas whose plant host range is limited to palms (Arecaceae) and the palm like aborescent monocots Pandanus utilis (Pandanceae) and Carludovica palmata (Cyclanthaceae) only. RFLP analysis of PCR-amplified rRNA operon sequences used as a basis for comparing phytoplasmas revealed differences among strains associated with LY disease of coconut in Florida, Mexico Honduras and Jamaica and was attributed to rRNA interopeon sequence heterogenity. Strains examined in Florida, Mexico and Honduras all possessed this attribute whereas Jamaica strains uniformly lacked this attibute. However, this distinguishing genetic characteristic could not be linked to unexpected widespread losses to LY of resistant Malayan dwarf and hybrid MayPan coconuts in Jamaica during the last three years as similar mortality of these cultivars has also occurred in southern Florida. An in situ PCR investigation clearly revealed phytoplasma DNA in embryos from some fruit aborted from LY-symptomatic coconut palms thereby raising the possibility of seed transmission of LY in this palm species. However, one important limitation to phytoplasma detection by DNA-based methods such as in situ PCR is that none of these methods are capable of selectively discriminating viable from nonviable phytoplasma. Future progress toward clearly resolving the fate of phytoplasma-positive seeds will require study of a more amenable herbaceous plant pathosystem rather than an intractable woody perennial host such as coconut. Thirty nine monoclonal antibodies (Mabs) were raised against sonicated (LY) phytoplasma cells extracted from coconut tissues and purified by discontinuous Percoll density gradient centrifugation. Of these, Mabs most useful for distinguishing LY-diseased from healthy coconut extracts were identified by indirect ELISA assay of coconut trunk phloem samples. Development of a lateral flow test for rapid field diagnosis of LY disease of palms is in progress in partnership with Pocket Diagnostics, a private sector company based in the UK.
Impacts: Development of a sero-diagnostic assasy for rapid, practical field diagnosis of coconut lethal yellowing (LY) disease in conjunction with a detailed understanding of plant host range and genetic variation among strains of the uncultivable phytopathogenic mollicute that causes LY will facilitate new strategies for disease contol and assist those charged with long term coconut germplasm improvement and dissemination.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FTL-03807

Title: ***INTEGRATED MANAGEMENT OF ORNAMENTAL PLANT PESTS***

Critical Needs:
National Goals: 1, 4
Key Themes: integrated pest management; ornamentals; cultural control (insects); biological control (insects); insect colonies; insect population; population density; pesticide evaluation; non chemical control (insects); beauveria bassiana; steinernema riobravis; imidacloprid; application rate; insecticide application; rhynchophorus; tetranychidae; metamasius hemipterus
Summary: The amount of insecticide used and associated health and environmental concerns regarding applications within urban areas presents unique considerations. This work will investigate use of cultural, and biorational tactics for ornamental plant pest management as well as determine methods to improve the efficacy of insecticide use.
Progress: Metamasius hemipterus sericeus is an important pest of sugarcane, palms and other tropical plants. After pairing males and females, it took an average of 27 days for females to begin oviposition.

The oviposition period lasted 57 days. Females lived 142.3 days and laid an average of 52 eggs. Mean egg production during the oviposition period was 1 egg/day. Fertility averaged 81 % eclosion during the oviposition period. Response of M. h. sericeus to traps baited with sugarcane and aggregation pheromone was investigated over a two year period and also within several 24-hour cycles. Capture of weevils varied through time but peaked in the spring following the beginning of the rainy season. Diel observations indicated a strong crepuscular activity pattern. We documented the decline of a 2-hectare Canary Island date palm (Phoenix canariensis) nursery caused by the palmetto weevil (Rhynchophorus cruentatus) in Dade County, FL. External palm symptoms were defined, divided into nine categories, and representative palms were destructively harvested to assess internal weevil associations. Apparently healthy palms declined and died in a mean of 49 days. At the beginning of the study (March 1997), 42% of 950 palms appeared healthy but within seven months only 3% were alive. Economic losses were estimated at $285,000 - $380,000 for the nursery studied. The mean palm weevil counts ranged from 0.3 to 223.3 weevils per palm, for healthy to collapsing palms, respectively. Twenty-four weevil grubs were sufficient to kill one mature palm. External symptoms did not allow preventative diagnosis and treatment of internal R. cruentatus infestations. Thus, phytosanitation (palm removal and destruction) for management of R. cruentatus in Canary Island date palms should be implemented as soon as host leaves droop and weevil frass is observed. Growers and buyers of P. canariensis in regions where R. cruentatus exists should be aware of the potential lethal risk that it poses for this non-native palm. The costs of aggressive phytosanitation at the first symptoms of R. cruentatus infestation and prophylactic pesticide treatment at times of pruning, stress, or transplanting should be factored into the predicted cost of production and maintenance of Canary Island date palms in Florida. The aggregation pheromones were studied from two geographical isolates (Hawaii and Queensland, Australia) of the New Guinea sugarcane weevil, Rhabdoscelus obscurus. Coupled gas chromatographic-electroantennographic detection (GC-EAD) and GC-mass spectrometric (MS) analyses of Porapak Q volatile extract from male and from female Hawaiian R. obscurus revealed a single EAD-active, male-specific candidate pheromone which was identified as 2-methyl-4-octanol (1). Corresponding volatile analyses from male and from female Australian R. obscurus revealed three EAD-active, male-specific candidate pheromone components; 1, (E2)-6-methyl-2-hepten-4-ol (rhynchophorol) (2), and 2-methyl-4-heptanol (3). Field experiments confirmed that 1 is the pheromone of the Hawaiian R. obscurus population and that 1 and 2 in combination, but not singly, are pheromone components of the Australian R. obscurus population.
Impacts: Better understanding of the risks associated with production of Canary Island date palms for ornamentals due to the native palm weevil, Rhynchophorus cruentatus. Identification of male-produced pheromones of New Guinea sugarcane weevil will aid in trap development for monitoring in countries with this weevil and for preventing entry of the weevil at ports of entry in countries without the weevil. Studies about the introduced silky cane weevil. Metamasius hemipterus sericeus will help in development of monitoring and management strategies in southern Florida.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FTL-04047

Title: ***BEHAVIORAL ECOLOGY AND CONTROL OF SUBTERRANEAN TERMITES***

Critical Needs:
National Goals: 2
Key Themes: foraging behavior; isoptera; insect behavior; coptotermes formosanus; reticulitermes flavipes; insect population; areawide control; population control; insect control; insect colonies; baits; insect attractants; insect ecology; quality maintenance; wood; wood products; successions; invasion; establishment; insect dispersal; simulation models
Summary: Due to the cryptic habit of subterranean termites, little is known of their foraging behavior, and this has hindered the development of effective control measures. We now possess a technology to

eliminate colonies of subterranean termites, but little is known for the consequence of eliminating colonies in a large area. To elucidate the tunneling geometry and foraging behavior of subterranean termites and to examine the succession ecology of colony populations of subterranean termites for an area-wide population management project.
Progress: A dimensionally stable sensor was developed for incorporation in a computerized remote monitoring system to automate and improve monitoring efficiency for termite activity in the monitoring stations. The mean monthly sensor accuracy for 3 field test sites was 98.7%. Laboratory study with two-dimensional foraging arenas showed that C. formosanus and R. flavipes tunneled significantly more in sand with a higher moisture content than in sand with a lower moisture content, while maintaining a fractal geometry. The monitoring-baiting system developed by this project is safe, non-intrusive and non-interruptive, and provided an important tool for managing subterranean termite infestations in culturally and environmentally sensitive historic sites. In addition to the Statue of Liberty National Monument as reported previously, the system was used successfully to control subterranean termite infestations in various historic sites such as San Juan National Historic Site, Cane River Creole National Historical Park, New Orleans Jazz National Historical Park, Fort Christiansvaern, Christiansted National Historic Site, St. Croix, United States Virgin Islands, and the historic Tzu-Su Temple of San-Shia, Taiwan.
Impacts: The commercial version of the automated sensor system is being used commercially as the Sentricon System with ESP Technology to reduce labor costs associated with the baiting system. Laboratory study confirmed for the first time that moisture in soil increased activity of subterranean termites. Extension agents should be able to convey the results to homeowners. The monitoring-baiting system developed by this project provided a safe, non-intrusive and non-interruptive tool to protect many historic sites from infestations by subterranean termites.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FTL-04066
Title: ***ENVIRONMENTAL MANAGEMENT OF WEEDS IN TURFGRASS***
Critical Needs:
National Goals: 1
Key Themes: weeds; stenotaphrum secundatum; cynodon dactylon; paspalum notatum; golf courses; lawns; plant competition; plant ecology; turf grasses; turf; farms; plant population; plant biology; wetlands; weed control; cultural practices; herbicides; alternatives; atrazine; msma; mowing; watering; fertilization; plant canopy; biomass; seed production; seedlings
Summary: Weeds in turfgrass cost Florida citizens millions of dollars each and involve large amounts of chemical weed killers. Weed management in turfgrass can be made more effective and more efficient by understanding cultural practices such as irrigation, mowing, and fertilization. Alternatives are needed for some herbicides that may harm water quality in Florida. This project describes the relationship of cultural practices and weeds, particularly for home lawns, and of weed populations in golf courses and sod farms, so that chemical weed killers can be used effectively in lower dosages.
Progress: Mature goosegrass (Eleusine indica) was controlled (> 85% dead) in 'Tifway' bermudagrass (Cynodon sp.) golf and sports turf with 2 applications of foramsulfuron at 0.029 or 0.044 kg ai/ha + metribuzin at 0.105 to 0.210 kg ai/ha, sprayed on a 7-d interval. Goosegrass control was as good or better from foramsulfuron + metribuzin, compared with MSMA + metribuzin. Bermudagrass phytotoxicity was temporary. In one location there was noticeable phytotoxicity 4 wk after initial treatment. Foramsulfuron at 0.029 kg ai/ha + metribuzin at 0.79 kg ai/ha in two applications, beginning 39 days after seed planting of Princess-77 bermudagrass, removed dense goosegrass with no injury to the bermudagrass turf. Weeds in turf can be controlled to some degree culturally, without herbicides. A review of over 750 scientific papers on turfgrass weed control showed that only 25 papers emphasize cultural management. Close mowing contributes to higher weed populations in cool-season turfgrasses. Higher rates of N fertilization, 100 to 300 kg N/ha/yr, contribute to lower weed populations. Weeds can be reduced in turfgrasses by reduction of environmental stresses, including drought injury, unnecessary aeration and vertical mowing,

and biotic stresses such as nematodes, insects, and diseases. Adapted cultivars and species of turfgrasses that are genetically resistant to some of the biotic and environmental stresses, have fewer weed problems, and can be managed in the absence of herbicides. There are possible tradeoffs among choices of herbicide use and cultural techniques for weed management. A high N fertilization rate, while reducing weed populations, costs more in fossil fuel use, increases mowing energy requirement, and may have negative environmental consequences. Optimum management of the goosegrass population system is being evaluated. Dollarweed (Hydrocotyle umbellata) is the most serious weed of St. Augustinegrass (Stenotaphrum secundatum) lawns in Florida. Irrigation management was used to reduce dollarweed populations in the field. High (daily to replace evapotranspiration) irrigation supported 30% dollarweed infestation, but moderate (weekly to saturate the root zone when wilted) and low (only rarely under extreme wilt) irrigation caused the reduction of dollarweed populations to less than 10%. Three field studies were assessed herbicides and rates of application to remove perennial ryegrass. Removal of 80% perennial ryegrass should be achieved in not less than 14 d, nor more than 21 d, after herbicide treatment, and 50% removal must be achieved within 10 d after treatment. Diclofop caused acceptable speed of perennial ryegrass removal in three years, at 910 to 1140 g/ha. Foramsulfuron caused acceptable though rapid perennial ryegrass removal at 7 to 29 g/ha. Metsulfuron caused acceptable speed of perennial ryegrass removal at 5 to 20 g/ha. Pronamide caused acceptable speed of perennial ryegrass removal at 1140 g/ha, in two of three years. Rimsulfuron caused too rapid perennial ryegrass removal within the range of rates used, but might be effective at 7 g/ha or less.
Impacts: Discovery that foramsulfuron is an herbicide replacement for MSMA is helpful. MSMA is widely used for goosegrass control in golf and sports turf in sand soil and is associated with excessive concentrations of arsenic in the surficial aquifer of South Florida. Research on cultural management of weeds turf is an important public interest, representing about 3% of the total published research, while herbicide research represents about 97% of all published research on weeds of turfgrass.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FTP-03700

Title: ***PLANT GROWTH REGULATORS TO ENHANCE PROFITABILITY OF FRESH AND PROCESSED FLORIDA CITRUS***

Critical Needs:
National Goals: 1, 2
Key Themes: growth regulators; profitability; citrus; fresh produce; processed food; hedging; production management; fruit quality; spraying; gibberellic acid; production systems; fruit size; food storage; freezing resistance; crop productivity; crop yields; performance evaluation; economic analysis; fruit juices; cold hardiness; topping (trees)
Summary: Plant growth regulators (PGRs) are effective in improving fresh fruit quality and production in citrus but have given unpredictable and variable responses. Developing reliable recommendations for use of PGRs and adoption by the Florida industry should contribute to citrus profitability. This project determines the effectiveness of PGRs in controlling cropping of citrus, evaluates the effect of PGRs on citrus fruit quality, and identifies procedures for effective use of PGRs in Florida citrus.
Progress: For 4 years, tested cumulative benefits of consistent thinning strategies. Each year different plots were maintained as controls, received annual high NAA rate, received annual intermediate NAA rate, received high NAA rate if initial fruitlet set exceeded a threshold, or received intermediate NAA rate if set exceeded threshold. Throughout the study period, no overcropping was evident in these blocks even though previously observed. Routine use of NAA thinning appears largely unwarranted in FL citrus and this practice may be best restricted to use in occasional blocks where excessive cropping is evident. Established 4 trials examining effects of temp. and water relations on NAA thinning. Harvest will occur in 2004. Topping and hedging have been the standard FL practices for controlling excessive cropping and

increasing fruit size. However, in numerous experiments, we have seen no increase in fruit size from combined hedging and topping during physiological drop. In 2001 severely overcropped Murcott trees were topped only, and even though conducted quite late with modest canopy reduction, mean fruit size increased 12% by topping with no reduction in yield. Established 2003 experiment to test hypothesis that removal of significant leaf area may influence water relations. Most topping treatments have shown a transient improvement in water relations, with less negative stem water potential. Exploring various strategies for enhancing fruit size: GA3 applications to reduce flowering and bloom duration, topping, and both PGR and nutrient induced fruit growth are being contrasted in Flame, Sunburst, and Murcott. All GA3 applications to grapefruit essentially eliminated flowering. GA3 is known to reverse flower differentiation when applied early in development, and low Jan. 2003 temperatures must have slowed bud development in grapefruit. Topping pre-bloom accelerated flowering. Weekly flower counts revealed that percentage flower removal greatly exceeded percentage canopy removal. GA3 applications at bloom are widely used to enhance fruit set in Minneola, but response is irregular. CPPU, a synthetic cytokinin, enhances parthenocarpic set in kiwi and cucurbits. We compared CPPU at various rates and timings with the standard GA3 application and non-thinned controls. Harvest has not yet occurred, but visual evaluations suggest that GA3 was the most effective treatment. In-vitro experiments demonstrated that low levels of copper reduce pollen germination and pollen tube growth. We tested whether bloom-applied copper would reduce pollination and that concurrent GA3 may encourage seedless fruit set. 2 trials compared 3 rates of GA in all combinations with 3 rates of copper fungicide. In Sunburst seed number per fruit was not affected, but GA3 somewhat increased yield. In 2003 we conducted 2 studies in which citrus nursery liners were treated with an array of ABA concentrations, as preplant root soaks for 6 hours or 10 min, and were then subjected to water stress. 300 ppm ABA resulted in rapid defoliation and often tree death. More moderate ABA rates delayed tree flushing.
Impacts: NAA thinning of mandarins clearly reduces alternate bearing and increases crop value on sites which are otherwise overcropped. This will become a routine tool in citrus production. Winter GA3 will become a common practice for enhancing fruit size.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-FYC-03923
Title: ***EVALUATION RESEARCH IN THE AREA OF YOUTH DEVELOPMENT AND YOUTH CRIME AND VIOLENCE IN PUBLIC SCHOOLS***
Critical Needs:
National Goals: 5
Key Themes: intervention; program effectiveness; program evaluation; human resources; human development; crime; violence; conflicts; prevention; legal aspects; schools; safety; human behavior; sociology; family members; trends; school districts; aggression; risk assessment; data analysis; quantitative analysis; community problems; temporal distribution; comparative analysis; decision making
Summary: Certain risk factors lead to increased youth crime and violence in Florida schools. The purpose of this study is to determine which interventions are effective in creating positive behavior change toward reducing youth crime and violence.
Progress: Objective 1 Findings: (1) Findings from an analysis conducted to compare actual rates of school crime and violence incidents reported in Florida schools versus perceived levels of safety held by 2,073 Florida elementary, middle, and high school students, parents, and teachers found that elementary school level participants perceived that the following are problems at their school: fights, stealing, and threats; data analysis on incidents confirms that fights, stealing and threats were indeed occurring the most frequently. (2) Over half of the middle school participants believed that fighting, threats, theft, and property damage were the four leading problems on their campuses; while fighting, disorderly conduct, violent acts against persons and harassment (including threats) were the four leading problems reported. (3) High school participants identified fighting, threats, stealing, and property damage as the most problematic during school; the five most frequently reported incident types were: Disorderly Conduct,

ATOD, Fighting, Property and Harassment, indicating that high school students had a realistic perception of problems at their schools. Objective 2 Findings.(1)Another research project examined the effects of Aggressors, Victims and Bystanders, a Harvard program designed to prevent violence, in three Palm Beach County middle schools against two control schools. Control and intervention group responses to pre-, post-and post-post surveys of teachers, students, and school police officers found that the program significantly impacted youth in many of the cognitive areas related to the roles of being an aggressor, victim or bystander and also had moderate impact in some others;(2)A change of positive outcomes of programmatic impact was found specifically related to student beliefs that (a)people's violent behavior can be prevented; (b)they can make a difference in helping to prevent violence;(c)people can be taught to help prevent violence;and(d)doing or saying certain kinds of things can work to help prevent violence. Objective 3 Findings (1)A longitudinal study completed on the 12,191 juvenile first offender cases handled in the first seven years of the Palm Beach County Youth Court determined that the most frequently occurring juvenile first offenders in the program were 16-year old white males; the most frequently occurring first offenses are retail theft, possession of marijuana, battery, possession of paraphernalia, and petit theft;(2)The study documented changing trends in crimes committed by year, age, race/ethnicity and location;(3)It also found gender differences in first crimes committed by males and females; females most frequently committed retail theft at higher rates than males, and to a lesser degree committed battery, possession of marijuana, disruption of school activity, and possession of paraphernalia violations. Objective 4 Findings:(1)The success of PBCYC cases processed (72.4% over the 7-year period) and recidivism rates were also determined, which found that approximately 85% of the youthful first offenders were positively affected such that they did not commit a second crime.
Impacts: Discovering the types of violent or problematic incidences taking place on campuses and in local communities by youthful offenders is another ingredient in the formula for safer schools. This examination of changing trends and programmatic impacts will allow youth workers and police officers to specifically target key areas and behaviors with the appropriate programs and interventions.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-FYC-03960

Title: ***ENHANCING FOOD SAFETY AND QUALITY THROUGH TECHNOLOGIES AND CONSUMER RESEARCH***

Critical Needs:
National Goals: 1, 2, 3
Key Themes: carotenoids; vitamin e; lutein; tocopherols; ascorbic acid; food safety; tocotrienols; high pressure; folates; tomatoes; potatoes; sensory evaluation; consumer preferences; vegetables; post harvest; fruit; food quality; food processing; product improvement; food chemistry; food storage; food handling; food nutritive value; quantitative analysis; consumer behavior; new technology; consumer surveys; irradiation; thermal processing; comparative analysis
Summary: Traditional heat processing resulted in significant loss of desirable sensory quality and/or health-promoting components in fruits and vegetables. Non-thermal processing such as high hydrostatic pressure may have significant protential to preserve quality and the health-promoting components. This project will examines alternative technologies to enhance quality and safety of fruits and vegetables and selected foods.
Progress: Objectives of this research plan are to 1) Evaluate selected chemical, nutritional, physical, microbiological and sensory changes in selected foods as affected by technology, handling, or storage, and 2.) Gain qualitative and quantitative consumer information related to food safety and quality and to better understand consumer behaviors with respect to food safety and quality. Two major studies were completed. First the evaluation of consumer preferences among six varieties of Eastern (E), Western (W) and Galia (G) - types grown in Florida environment. The taste tests were conducted in June 2001 and

2002 following the guidelines and recommendations from the American Society of Testing Materials. The results show that the industry standard Athena was top rated in flavor and overall preference in 2001, but was only ranked fourth overall. The overall top three rated varieties were Mission (W), Odyssey (E), and Inbar (G). The eating quality of Passport (G) was consistently below median values. The interaction between year and sensory attributes was significant, suggesting that conditions other than soil type and variety, and possibly including weather conditions, affected consumer preference. These panels preferred the sensory characteristics of the eastern-type and orange-fleshed varieties over those of the western-type and yellow-fleshed ones, respectively. American's exposure to ethnic foods has expanded while little information is available about the safety of these foods. The second study examined CDC foodborne illness data (1990 to 2000) for ethnic foods to determine food safety trends in this food. Total outbreaks for ethnic foods rose from 3% to 11% while the total number of cases showed no specific trend. Since most outbreaks reported were for Mexican, Italian, or oriental foods; this paper will focus on these three categories. Highest outbreaks occurred in restaurants (43 %), private homes (21 %), schools (7 %), and others (29 %), and the top five states were Florida (n=136), California (n=74), New York (n=42), Maryland (n=40), and Michigan (n=37). The etiologies of ethnic food outbreaks were primarily unknown (61 %) then Salmonella spp (18 %), Clostridium spp (6 %), Bacillus spp (4 %), Staphylococcus spp (4 %), and all others (7 %). Based on known etiology, each ethnic category had its own profile of microorganisms and characteristic foods. Current food manager certification may not adequately cover specific details desired for ethnic food preparation. The findings should bring awareness to food safety professionals of unique issues and risks related to ethnic foods.
Impacts: The results of these two studies will be beneficial to educators, consumers, Florida growers, producers and others. In addition, the results from these studies will be used to obtain additional funding to support future research and educational programs for Floridians.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-HOM-03998

Title: ***SUSTAINABLE VEGETABLE PRODUCTION SYSTEMS FOR SOUTH FLORIDA BASED ON USE OF COVER CROPS, PRECISION IRRIGATION AND CHEMICAL SOIL STERILANTS***

Critical Needs:
National Goals: 1, 4
Key Themes: economic evaluation; sustainable agriculture; cover crops; methyl bromide; methyl iodide; beans; cowpeas; tensiometers; soil nematodes; vegetables; crop production; production systems; precision farming; irrigation; soil fumigants; agricultural economics; tomatoes; plant physiology; systems development; peppers; potatoes; plastic mulches; mulches; fumigants; cucurbita; crop rotation; weed control; nematode control; plant disease control; crop residues
Summary: Use of methyl bromide in vegetable production will be phased out by 2005. Cost of vegetable production must be lowered substantially to meet competition under NAFTA. The purpose of this project is to develop biologically based production systems, which allow Florida growers to compete strongly under NAFTA without the use of methyl bromide.
Progress: Evaluation of velvetbean accessions. We determined the biomass production by various velvetbean accessions, number of days from seeding to first flowers, and nature of flower production. Each plot was 10m long with 5 rows with 60cm between rows. Lines 1-7 were planted with 30 cm between plants within the row, and lines 8 and 9 were planted with 20 cm between plants within the row. The combined biomass (gms) from a 4.19 m2 sample from the center of the plot plus the vines and/or leaves growing out from the west end of the plot were as follows: Line 1 (7301), Line 2 (8810), Line 4 (7730, Line 5 (7004), Line 6 (5869), Line 7 (7172), Line 8 (3613) and 'Georgia Bush'or Line 9 (2605). Time from seeding to appearance of first flowers was 110 days for Lines 8 and 9, 125 days for Line 4, and 160, 167,133, 182, and 160 for Lines 1, 2, 5, 6 and 7. Only lines 4, 8 and 9 had determinate

flowering. Effect of cover crops on okra yields. To evaluate the effects of sorghum sudangrass, sunn hemp and velvetbean on okra yields, 1.33 acres of each was planted in May 2003. Velvetbean germination was poor and skips were replanted in early June. After these cover crops had been terminated and incorporated into the soil, okra was planted. Okra fruit yields (gm/7.7m of row) from 24 harvests were 6150 for velvetbean, 5135 for sunn hemp and 4624 for sorghum sudangrass. Thus the okra yield in the velvetbean treatment was 30 percent greater than in the sorghum sudangrass yield. A nematode new to Florida was discovered in a tomato field near Tamiami Airport, Miami-Dade County. It is Melodogyne graminicola, a pest of rice and grasses in troipical countries.
Impacts: The tropical legumes, velvetbean and sunn hemp, when grown in rotation with cash crops, can be expected to improve soil properties, suppress weeds and plant parasitic nematodes, and result in higher cas crop yields.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-HOS-03559

Title: ***SENESCENCE PHYSIOLOGY AND DETERIORATION IN HARVESTED TOMATO AND OTHER FRUITS***

Critical Needs:
National Goals: 2
Key Themes: plant physiology; fruit; tomatoes; senescence; post harvest losses; fruit quality; ripening; storage stability; polysaccharides; environmental stress; enzyme activity; low temperature; ph; cell wall; electrolytes; watermelons; tropical fruit; fruit processing; membrane permeability; fruit softening
Summary: The shelf-life of fresh fruits and fresh-cut fruit products is limited by senescence and other factors contributing to deterioration. The purpose of this study is to learn more about the cellular physiology contributing to the deterioration and senescence of fruits and fruit products.
Progress: Ethylene-induced placental-tissue water soaking in harvested watermelon fruit is accompanied by cell separation and collapse, depolymerization of water- and chelator-soluble pectic fractions, a loss in total uronic acids, and increased polygalacturonase activity. In this study, we investigated whether hemicellulosic polysaccharides were altered in response to ethylene treatment. Watermelon fruit harvested at the full-ripe stage were treated with 50 microL per L ethylene or air for 5 days at 20 C. Visual inspection confirmed the development of water soaking in ethylene-treated fruit. Alkali-soluble (4 N) hemicelluloses were prepared, and mol mass distributions examined using Sepharose 6B-200 chromatography. Polymers from 0 day and 5 day air-treated fruit were similar in mol mass distribution, with the majority of polymers eluting within the void volume of Sepharose 6B (MWCO for polysaccharides = 1 X 10 E6). In contrast, polymers from ethylene-treated fruit showed significant mol mass downshifts involving xyloglucan (XG) polymers. Total hemicelluloses were enriched in XG, with xylose and glucose comprising nearly 70 % of total 4 N alkali-soluble neutral sugars. Treatment of watermelon fruit with ethylene was not accompanied by changes in hemicellulose composition, indicating that depolymerization did not result in increased solubility and loss of XG. Cell-free protein extracts from watermelon placental tissue degraded tamarind seed xyloglucan, resulting in significant mol mass downshifts. Similarly, watermelon hemicelluloses were degraded by the protein extract, resulting in mol mass distributions similar to those noted for ethylene-treated fruit. Xyloglucanase activity assessed using tamarind xyloglucan was similar between ethylene- and air-treated fruit, indicating that enzyme levels per se are not the primary factor increasing xyloglucan depolymerization in ethylene-treated watermelon fruit. Water soaking in watermelon was accompanied by increases in the activities of phospholipase C (13.8%), phospholipase D (21.5%), and lipoxygenase (10.0%), and a significant increase (26.3%) in phosphatidic acid (PA). Declines in phosphatidylcholine (17.8%) and phosphatidylinositol (22.5%) were noted. Water-soaking symptoms were not observed in fruit that had received treatment with 5 microliters per liter 1-methylcyclopropene (1-MCP) for 18 h prior to ethylene exposure; however, ethylene-induced increases in

PLC, PLD and LOX were blocked 50-75 % in 1-MCP-treated fruit. The high perishibility of breadfruit has been well documented and is in large part responsible for the limited distribution of this fruit. Although the breadfruit does not possess the ripening dynamics of typical climacteric fruits such as avocado and papaya, its high respiration rate and ethylene production make it a likely candidate for positive responses to wax and 1-MCP treatments. For reasons not yet understood, mild bruising of mature-green and turning stage tomato fruit has an adverse influence on tomato aroma and flavor volatiles.

Impacts: The information determined in these studies will aid in our understanding of why watermelon fruits react adversely to external sources of ethylene. The typical response is rapid and severe watersoaking, brought about by physiological changes affecting several tissue components. The problem is likely of significant importance to the watermelon industry, but estimates of these losses are not available because of the commercial unawareness of ethylene's role in the disorder. The use of food-grade waxes has great potential for extending the shelf-life and export potential of highly perishable tropical fruit including breadfruit.

Source of Federal Funds: Hatch

Scope: Integrated

Project Number: FLA-HOS-03601

Title: ***IDENTIFICATION OF GENETIC AND PHYSIOLOGICAL MECHANISMS OF THERMOTOLERANCE IN LETTUCE SEED***

Critical Needs:

National Goals: 1

Key Themes: seeds; vegetables; plant physiology; plant genetics; heat tolerance; lettuce; seed germination; seed dormancy; seed vigor; metabolic regulation; breeding lines; physiological criteria; germplasm; high temperature

Summary: Genetic, physiological and environmental mechanisms associated with seed affect germination, vigor, and yield in field crops. This project evaluates various conditions affecting germination, vigor, and yield in field crops, including seed preparation and temperature. Genetic aspects will also be investigated to determine thermotolerance.

Progress: Lettuce genotypes have different germination characteristics under different temperatures from 20 to 36C. The upper temperature limit for germination of lettuce seed could be modified by manipulating the temperature during seed development. Thus, the potential thermotolerance of seed thereby increased, where in thermosensitive genotypes became thermotolerant and thermotolerant genotypes germinated fully at 36C. Thermosensitive and thermotolerant genotypes were determined to have different puncture force of the seed and endosperm during imbibition and priming the seeds reduces the puncture force especially in thermotolerant lines. Differences in germination of the different genotypes were further attributed to the production of ethylene based on experiments using the precursor ACC and the inhibitor silver thiosulfate. Enzyme-mediated degradation of endosperm cell walls is a crucial factor for lettuce germination at high temperature. By increasing the concentration of ethylene in thermosensitive lettuce seeds by providing ACC either during priming or during germination, endo-beta-mannanase (EBM) activity was increased and the inhibitory effect of high temperature on germination was overcome via weakening of the endosperm. Endo-beta-mannanase was found prior to germination and activity prior to germination was higher in thermotolerant lines than thermosensitive lines. Furthermore, priming increased the activity of EBM and more so in thermotolerant lines than thermosensitive ones. Maturation of lettuce seed at 30/20C (day/night) compared to 20/10C leads to more ethylene production when seeds were subsequently germinated which can account for their improved germination at supraoptimal temperature. Transgenic lettuce seed were developed to have reduced ethylene perception than wild-types. Imbibition in dark at both optimal and supraoptimal temperatures led to reduced ethylene production compared to the production in light. The unaffected germination of both thermosensitive (DGB) and thermotolerant (EVE) seeds with reduced ethylene perception at optimal temperature and reduced germination at supraoptimal temperatures supported the hypothesis that the requirements for

ethylene increases as imbibition temperatures increase. DGB-transgenic seeds had reduced germination at much lower temperatures than did EVE-transgenic seeds which also produced significantly less ethylene than the EVE-transgenic seeds. Reduced ethylene perception led to reduced ability of both thermosensitive and thermotolerant lettuce seeds to germinate at supraoptimal temperature indicating an important role for ethylene in lettuce germination at high temperature.
Impacts: Outcomes of this research will benefit both the fundamental seed biology core and the seed industry. This research will provide a better understanding of the hormonal regulation of seed development, dormancy, regulating seed germination and of the importance of enzyme regulation (causing the weakening of the endosperm) in overcoming dormancy. This research can potentially provide the seed industry with lettuce seed with having higher ability to germinate at supraoptimal temperatures. This can result in no need of high-cost commercial priming of lettuce seed, thus improve vigor, stand establishment, and ultimately reduce the cost of lettuce seed.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-HOS-03675
Title: ***REGULATION OF PHOTOSYNTHETIC PROCESSES***
Critical Needs:
National Goals: 1
Key Themes: plant physiology; citrus; sweetcorn; plant biochemistry; efficiency; photosynthesis; metabolic regulation; phloem loading; translocation (genetics); sucrose; sucrose synthase; gene expression; plant genetics; invertase; carbohydrate metabolism; plant enzymes; soluble compounds; signal transduction; mutation; plant metabolism; enzyme activity
Summary: FL-AES will study sucrose synthase and invertase, as enzymes responsible for photosynthate processing. We have shown that isoforms differ in their reegulation by cellular carbohydrate levels. Probes for an invertase gene family (with those available for two sucrose synthases) will be prepared to elucidate the relationship between sugar-responnsive gene expression and the widespread role of soluble invertases in initial growth by newly expanding sink tissues. The effects of sugar modulation, developmental signals and mutations on expression of sucrose metabolism genes will be studied in maize root tips, and the changes in enzyme activity, protein localization, and import will be measured.
Progress: Sucrose metabolism is critical to growth of harvestable plant parts and its use is initiated by only two known enzyme reactions, either SuSy (sucrose synthase, a reversible reaction) or invertase (in cell walls or vacuoles). Products of the invertase and SuSy paths differ and so does their potential to generate sugar signals (Koch et al, 2000; Koch and Zeng, 2002). Such signals can repress genes for photosynthesis, and also affect invertase and SuSy genes themselves (Koch et al. 2000; Koch and Zeng, 2002). In addition, sugar signals sensed through hexokinase can potentially be amplified by repeated cycles of sucrose cleavage and re-synthesis. Invertase action and resulting signals are typically associated with growth, expansion and cell division, whereas SuSy is more often linked with biosynthesis of cell walls and storage materials (Koch et al. 2000; Koch and Zeng. 2002). Further evidence indicates a central role for soluble invertases during cell-division phases of maize kernel-set (Commuri et al. unpublished; Andersen et al. 2002), during expansion of stem and leaf cells (unpublished data), and during rapid chances in cytokinin metabolism (unpublished data). In contrast, SuSy also has broadly pleiotopic, but different roles. These include flood tolerance in maize (Zeng et al., 1998: 1999), fruit set under and vegetable yield under specific conditions in tomato and potato (Koch and Zeng, 2002), and critical, drought-sensitive and heat-sensitive steps in grain set (Andersen et al. 2002; Commuri, unpublished). Invertase and SuSy reactions thus play important and surprisingly far-reaching roles in carbohydrate metabolism. Invertase and SuSy regulation extends from transcriptional to post-transcriptional mechanisms. Transcription of both responds strongly to sugars (Koch 2000, Koch and Zeng, 2002), oxygen status (Zeng et al., 1999; Koch et al., 2000), and other abiotic factors (Andersen et al., 2002; Commuri et al., unpublished). Invertase and SuSy also differ with respect to stability of their mRNAs (Koch et al., unpublished). Further, SuSy proteins can be phosphorylated, which provides an especially

interesting means of regulating both activity and sub-cellular localization (work in progress). SuSy forms from both maize and soybean nodules are phosphorylated at multiple sites, and in most instances CDPKs and/or SnRKs have been implicated (Koch et al. 2000).
Impacts: Maize studies of invertase expression in young kernels indicate that soluble invertases are early targets of stress during the critical, abortion-sensitive period immediately before and after pollination. For plants, this provides a potentially advantageous means of adjusting reproductive load under stress. It also indicates a possible avenue for manipulating the extent of seed and fruit set for agricultural or horticultural advantage.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-HOS-03700
Title: ***PLANT GROWTH REGULATORS TO ENHANCE PROFITABILITY OF FRESH AND PROCESSED FLORIDA CITRUS***
Critical Needs:
National Goals: 1
Key Themes: citrus; production management; growth regulators; profitability; fresh produce; processed food; fruit juices; fruit quality; spraying; gibberellic acid; fruit size; freezing resistance; crop productivity; crop yields; performance evaluation; economic analysis; topping (trees); hedging; blooming; storage
Summary: 1)Plant growth regulators (gibberellic acid [GA]), naphthalene acetic acid (NAA), and amino ethoxyvinyl glycine (AVG) will be applied to mature citrus trees in several groves throughout Florida. 2) Data will be collected on fruit size, yields and quality. 3) GA biosynthesis inhibitors will be sprayed on young citrus trees and their freeze hardiness evaluated in freeze chambers.
Progress: Gibberellic acid (GA) increases juice Brix when applied to processing oranges in Florida. There is also some indication that it may affect citrus cold hardiness. We applied GA to Hamlin and Valencia oranges in the fall and monitored juice content changes following a freeze where fruit temperatures reached -3 C for more than 4 hours. GA-treated fruit had higher juice content than non-treated fruit for both cultivars and more importantly juice levels remained higher for 8 weeks following the freeze. The rate of change in juice content over time, however, was similar for both treatments. Maintenance of high juice levels after a freeze is of potential importance to growers and processors because the value of citrus fruit in Florida is based on juice content and Brix. There was no effect of GA on cold hardiness of the tree or fruit under north Florida conditions.
Impacts: Based on this research, thousands of acres of Florida oranges are sprayed with GA for increased juice weight, increasing profitability for growers and processors.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-HOS-03729
Title: ***GENETIC AND MOLECULAR CHARACTERIZATION OF PLANT GENES INVOLVED IN DISEASE RESISTANCE***
Critical Needs:
National Goals: 1
Key Themes: plant genetics; molecular biology; beans; tomatoes; virus diseases (plants); bacterial diseases (plants); plant disease resistance; gene cloning; bacteriology; virology; plant pathology; poty viruses; xanthomonas; mosaic (beans); mosaic virus; bacterial spot (tomatoes); bacterial blight (beans); gene function; gene analysis; inheritance; genetic markers
Summary: Viral and bacterial diseases represent two of the major limiting factors for tropical and sub-tropical agriculture. This project focuses on the genetics of resistance to bacterial spot in tomatoes and common bacterial blight in beans, and on the molecular genetics of the interactions between the bean common mosaic virus complex and the common bean.

Progress: We have constructed a BAC clone-based contig comprising the I locus of the common bean. This locus comprises a multigene family that belongs to the TIR-NBS-LRR class of disease resistance genes, and extends over approximately 500 Kb. Two lines of evidence indicate that resistance to BCMV is encoded by at least one copy of the TIR-NBS-LRR family. Through genetic analysis, we have determined that the resistance phenotype co-segregates perfectly with the multigene family, and that while no recombination has been detected within the multigene family, few recombinants have been detected between this megalocus and flanking single copy sequences. In addition, we have also found that transcripts from this multigene family are expressed at a higher level in the virus-unchallenged resistant line than in the susceptible line, and that the transcript level increases dramatically after inoculating with the virus.
Impacts: The I locus of the common bean controls resistance to 10 different potyviruses with host that include soybean, cowpea, watermelon, zucchini, adn passionfruit. Further characterization of the multigene family will likely identify reistance genes that may be useful in all these crop species.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-HOS-03822
Title: ***DEVELOPMENT OF SNAP BEAN VARIETIES AND GENETIC INVESTIGATIONS IN COMMON BEAN***
Critical Needs:
National Goals: 1
Key Themes: plant genetics; dry beans; beans; snap beans; new varieties; breeding lines; plant breeding; vegetables; phaseolus vulgaris; interspecific hybrids; rapd; genetic markers; gemini viruses; bean golden mosaic virus; plant disease resistance; plant adaptation; crop yields; consumer acceptance; genotypes; seed coats; color; linkage (genetics)
Summary: Introgress genes for disease resistance into elite snap bean germplasm by crossing and selection. Backcross marker genes for seed coat color and pattern into the recurrent parent 5-593 to BC3. Cross the genetic tester stocks to a range of market classes to develop a system of interpretation of F1 plant phenotypes. Use the standard six genetic populations derived from crossing two pure lines to investigate inheritance. Develop RAPD markers by bulk segregant analysis; and use RI lines to map the marked genes, using cloned RAPD markers.
Progress: The former seed coat pattern gene, Stp, was found to be allelic with the P locus, thus resulting in a total of five known recessive alleles at P. A study of inheritance of recessive red seed coat color controlled by the Rk locus resulted in the discovery of two new recessive alleles for Rk. One is rkcd from NW 63, which expresses dark red kidney color with C and light red kidney color with cu. Thus, the color expression of this gene is determined by the genotype at C. The second new recessive allele at Rk is rkp from Sutter Pink, which expresses a "pink" or light red kidney color requiring very dry cultural conditions for complete and durable expression. The inheritance of scarlet flower color and veins on the wing petals was found to be expressed by the genotype Sal Am with v, vlae, or Vwf. The gene Am is dependent on Sal for its expression, i.e., with sal/sal, Am has no expression. Both Sal and Am are genes originating in Phaseolus coccineus and introgressed into P. vulgaris for these studies. There is also a dark red (oxblood red) seed coat color associated with Am, either as a pleiotropic effect of Am or the expressionof a closely linked gene. The inheritance of yellow corona and hilum ring was found to be controlled by a gene (identity still not resolved) that is independent of Gy. The Mayocoba market class of dry beans must be homozygous for this gene to express strong greenish yellow color in the corona and hilum ring with genotype P [C r] gy J g b vlae Rk. Without the new gene, the corona and hilum ring would be dark purple from the effect of vlae. Heterozygosity for the new gene suppresses the dark purple in the corona, but not the reddish brown hilum ring color residual; whereas homozygosity for the new gene also suppresses the reddish brown hilum ring, leaving only yellow color in the corona and hilum ring.
Impacts: The results of the research described for this year provide bean breeders with a more precise understanding of the genetic basis for certain seed coat colors and patterns. This knowledge is a necessary

foundation to begin to understand the exact nature of the regulatory expression of seed coat genes on various biosynthetic pathways.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-HOS-04031
Title: ***DEVELOPMENT OF PLANT PATHOGENS AS BIOHERBICIDES FOR WEED CONTROL***
Critical Needs:
National Goals: 4
Key Themes: bacterial diseases (plants); biological control (weeds); weed control; fungus diseases (plants); amino acids; grasses; methyl bromide; stress tolerance; fermentation; pueraria; formulations; cyperus; amaranthus; portulaca oleracea; euphorbiaceae; cirsium; product development; plant pathogens; virulence; product improvement; prototypes; cooperative research; plant development; plant growth; growth inhibitors; pathogen identification; field trials
Summary: The use of plant pathogens as bioherbicides has been a feasible method of weed control in several cases. Two registered bioherbicides, Collego and DeVine, are sold in the United States. Development and use of bioherbicides can help to diversify weed control options, supplement chemical herbicides, and provide an alternative to methyl bromide. This project attempts to develop several bioherbicide agents shown to be effective in small-scale and noncommercial trials.
Progress: The growth of the bioherbicide Dactylaria higginsii was examined on media supplemented with sulfonylurea herbicides rimsulfuron and halosulfuron. The spores of this fungus germinated well in the presence of several concentrations of the herbicides. Hence the chemical herbicides do not seem to affect Dactylaria and hence a strategy to select more virulent bioherbicide by selecting for sulfonylurea herbicide selection is not possible. Current experiments are in progress to examine whether osmoprotectant chemicals can protect Dactylaria and enhance its survival and effectiveness for biocontrol of weeds.
Impacts: Improved methods to propagate, store and use Dactylaria higginsii should make it a more effective bioherbicide for weed control.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-HOS-04108
Title: ***DEVELOPMENT OF NEW POTATO CLONES FOR IMPROVED PEST RESISTANCE, MARKETABILITY, AND SUSTAINABILITY IN THE EASTERN UNITED STATES***
Critical Needs:
National Goals: 1
Key Themes: cultural practices; fertilizer practices; clones; potatoes; product development; plant pest resistance; plant improvement; marketability; sustained use; solanum tuberosum; fertilizer application; cropping systems; pre harvest; crop production; plant disease resistance; early blight (potatoes); late blight (potatoes); scab (potatoes); fungus diseases (plants); aphididae; plant nematodes; leptinotarsa decemlineata; crop quality; plant breeding; molecular biology; cultivars; production efficiency
Summary: Potato varieties need to be identified that improve production efficiencies without sacrificing production standards. This project will develop potato varieties that are of value to the potato industry.
Progress: This project is a multi-state potato variety evaluation program in which production and quality characteristics of new clones are compared to current commercially accepted varieties. Cooperative potato variety trials provide information on the production, adaptation, and performance stability of new potato clones under a wide range of geographic, climatic, soil, and cultural conditions. Twenty-four fresh market white-skinned, red-skinned, russet-skinned, and chip potato selections were evaluated as part of the program in Florida in 2003. The standard fresh market white-skinned variety, LaChipper, and red-skinned variety, Red LaSoda, for the region were not included in the trial. NY127 produced the highest total and marketable yields at was 74.6 and 67.2 MT/ha, respectively. NY127 is a buff colored tuber with

cream flesh color. Marketable yield for Atlantic, the standard chipping potato for the region, was 53.3 MT/ha. Specific gravity of Atlantic tubers was 1.073. No other numbered clone tested produced as well as or had the quality of Atlantic. AF1753-16 and ATX84706-2Ru were highest producing russet-skinned selections with a marketable yields of 42.8 and 35.8 MT/ha, respectively. The russet varieties had 27 and 12% of total yield rated as misshapen tubers, respectively.
Impacts: The coordination of trials on the East Coast insures that superior potato clones can be successfully grown in southern, as well as, northern seed producing states. In addition, the advanced clones tested in this project are, in most cases, close to release. Evaluation of these clones provides Florida growers with the background information needed to make insightful seed choices.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-IMM-03571
Title: ***DYNAMIC ECONOMIC ANALYSIS OF THE FLORIDA CITRUS INDUSTRY***
Critical Needs:
National Goals: 1
Key Themes: citrus; rootstocks; agricultural economics; economic analysis; fruit; fruit trees; tree age; regional analysis; tree yields; scions
Summary: Global competition is forcing Florida citrus growers to redesign production systems. This project evaluates production inputs and labor requirements and analyzes management practices which help to reduce unit cost of producing oranges and grapefruit.
Progress: The citrus mechanical harvesting program included three projects during FY 2003: 1. collecting performance data on mechanical harvesting systems; 2. yield and production effects of harvesting Valencia's after May 15th; 3. effects of CNMP (abscission) dosage and machine settings on harvest removal and recovery. Projects were funded by a one-year grant from the Florida Dept. of Citrus. FY2003 represented the fourth year of performance data collection. Performance estimates were developed for fruit removal, fruit recovery, labor productivity, and system harvesting capacities. The late season Valencia harvest trial was the first year of a two year study. Data on 8 treatments (machine type x harvest setting) were collected from two harvest sites on 4 harvest dates. Treatments will be replicated during May-June of 2004 on the same trees to determine yield effects of late season harvest by mechanical systems. The abscission dosage trial was conducted on two harvesting sites to collect data on how abscission performs with mechanical systems on early season (Hamlin) oranges.
Impacts: 16,900 acres were mechanically harvested during 2001-02. Depending on yield, harvest cost reductions translated to between $100 and $200 per acre in increased on-tree revenue. Results from late season trial will provide data on yield effects and threshold costs for mechanical harvesting to be effective post May 15th.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-IMM-03622
Title: ***WATER MANAGEMENT IN FLATWOODS CITRUS GROVES***
Critical Needs:
National Goals: 4
Key Themes: fruit; citrus; irrigation; irrigation management; orchards; flatwoods; rainfall; evapotranspiration; water management; plant water relations; water table fluctuations; water requirements; soil water; irrigation schedules; drainage; water budget; measuring equipment
Summary: Florida agricultural and urban interests are competing for limited water resources. This project will improve agricultural water-use efficiency for citrus and vegetable crops grown on Florida flatwoods soils.
Progress: 1. Effective rainfall (ER) is the portion of total rainfall that plants use to help meet their consumptive water requirements, and is an important component of water resource budgeting for

irrigation. USDA Technical Release No. 21 (TR-21) is used to predict ER and irrigation requirements for south Florida citrus, but its accuracy is in question due to high-intensity rainfall, poorly-drained soils, and partial irrigation coverage in micro-irrigated orchards. We evaluated the calculation of ER by TR-21 under these conditions by monitoring rainfall, irrigation, water table depth, evapotranspiration (ET), and soil water content inside and outside of the micro-irrigation wetted pattern in four orchards for a total of 83 site-months. We developed a soil water budget to calculate daily water table upflux, root zone water content, water used, and ER separately for the irrigated and non-irrigated root zones. Water budget ER calculated by site ranged between -3.3% and +18.2% of TR-21 ER, with a mean of +10%. A linear correlation between water budget ER and TR-21 ER using pooled data from all four sites yielded the equation Water Budget ER (mm) = (0.79)*[TR-21 ER (mm)] + 17.7, r = 0.84. A hypothetical ER comparison using 30-yr mean rainfall and ET data showed that annual ER calculated by TR-21 amounted to 673 mm, while water budget ER totaled 744 mm, or +10.5%. 2. Emitter plugging can be a serious problem in Florida micro-irrigation systems. Water treatment to address a clogging problem can be either preventative or remedial. Citrus growers annually spend between $15 and $40 per acre to unplug emitters, but remedial treatments often provide unsatisfactory results. Water treatment chemicals vary widely in stability, mode of action, corrosiveness, safety of use, dosage, and cost. Most commercial scaling inhibitors are composed of acids, chelating or complexing agents, or reducing agents. Analysis of scale from plugged micro-irrigation emitters indicated that it was mostly mineral matter containing about 25% Fe as oxides and hydroxides. In laboratory trials, irrigation line cleaning and maintenance chemicals were able to dissolve Fe scale and dislodge it from tubing walls. The concentration of an inhibitor had a major influence on its ability to prevent precipitation (the higher the better), and showed that these materials can increase the degree of a scaling problem if not applied at a high enough concentration. In the field, chemicals that dissolved and/or removed Fe scale included sodium hydrosulfite, citric acid, sulfuric acid, and two commercial products. Scale removal was not always accompanied by improved emitter flow, and sometimes increased the degree of the problem. Flushing irrigation lines during maintenance operations is extremely important. Citric acid was the only material tested that inhibited Fe scale formation. The potential for N leaching losses increases as water emission uniformity decreases. With fair or poor systems, some citrus trees could receive twice as much N fertilizer per year than others.
Impacts: 1. This project determined that the TR-21 method of determining effective rainfall has the reasonable degree of accuracy needed for the purpose of fair water allocation for micro-irrigated citrus on poorly-drained soils in south Florida. 2. This project has provided microirrigation system maintenance guidelines that will help citrus growers keep their irrigation systems clean and efficient. As system maintenance improves, less water and fertilizer will be wasted.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-IMM-04012
Title: ***BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES***
Critical Needs:
National Goals: 1, 4
Key Themes: bemisia argentifolii; eretmocerus; biological control (pests); tomatoes; peppers; anthonomus eugenii; insect biology; insect management; brassica; integrated pest management; management alternatives; life tables; parasitoids; insect population; nymphs; anthonomus hunteri; insect parasites; refuges; predator prey relations; natural enemies; mortality; fecundity; thrips
Summary: The key pests of the two major crops in southwest Florida, tomato and pepper are silverleaf whitefly and pepper weevil respectively. Pesticides are still widely used but cultural controls like crop free periods are still necessary and the potential for a greater role for biological control has been demonstrated. Consumer demand for less pesticide use will increase the attractiveness of biological control as a management alternative in vegetable production. To generate useful biological and ecological information on the arthropod complexes affecting selected Florida vegetables crops.

Progress: Conventional pesticides and biopesticides were evalutated on tomato for control of silverleaf whitefly, tomato pinworm and southern armyworm, in pepper for control of pepper weevil, in melon for control of pickleworm, in sweetcorn for control of fall armyworm and in cabbage for control of diamondback moth.
Impacts: Information was disseminated through publications, field days and grower talks. Increased use of new, selective insecticides replacing older, broad-spectrum insecticides has been noted. Biological control in greenhouses was promoted through presentations and publications.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-JAY-03609
Title: ***INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS***
Critical Needs:
National Goals: 1, 4
Key Themes: ornamental plants; floriculture; plant introductions; plant evaluation; information collection; nursery stock; field trials; plant adaptation; exotic plants; native plants; cercis; tropical plants; herbaceous plants; perennial plants; irrigation; plant propagation; cultural practices; landscape plants; propagation
Summary: Collection of Florida endemic or exotic taxa from geographical regions of similar climate, propagation by seed, or propagules, and production utilizing standard horticultural techniques common to the Florida horticulture industry. Comprehensive performance records will be maintained by assigning an accession number to each taxon under consideration. Following determination of propagation and nursery or greenhouse production protocols, field trials of new introductions will be conducted to determine the optimal landscape location (seaside planting, shade or sunny outdoor locations, and drought or heat tolerance) and method of landscape establishment and management (optimal irrigation and nutrition levels) will be conducted for suitable taxa. In all herbaceous perennial crops, standards of production will follow those outlined by the Perennial Plant Association in their national guidelines. Trial plantings of herbaceous material will be implemented in a manner which parallels those used in both Monticello and Bradenton research stations so that future comparison at these different locations will generate information of use to growers throughout the state of Florida.
Progress: Research on woody landscape plants continued to evaluate the landscape performance of Florida native herbaceous, woody and grass plants in low input landscapes. Data collection continues for field experiments evaluating woody plant tolerance to root knot nematode species, field production of new Magnolia grandiflora germplasm and Hypericum reductum germplasm. Manuscripts were prepared, presented or published describing the outcome of a field experiment to evaluate potential seed production of Buddleia cultivars that was terminated in Dec. 2002.
Impacts: Ongoing research focuses on the development of production and landscape establishement protocols for desirable landscape crops that are improved or distinct or crops that are not currently introduced into the horticulture trade. Results of greenhouse and field experiments continue to provide information on the landscape performance of both native and introduced species in response to environmental impacts such as low fertility and irrigation inputs or natural pests such as root knot nematodes. Local, regional, and statewide programing including web pages, presentations, and publications transfers the new information directly to state specialists, land managers, students and the horticulture industry. This information will ultimately influence plant breeding, selection, production and use in the laqndscape industry, therby ultimately reducing the inputs necessary for plant production, establishment and management
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-JAY-03620
Title: ***WEED BIOLOGY AND CONTROL FOR TURFGRASS AND THE LANDSCAPE***

Critical Needs:
National Goals: 1
Key Themes: weeds; grasses; landscape management; grass management; turf grasses; weed control; plant ecology; plant competition; herbicides; biological control (weeds); growth regulators; integrated pest management; plant reproduction; irrigation management; fertilizer practices; mowing; traffic; herbicide evaluation
Summary: The reproduction and competitiveness of selected turfgrass weeds will be measured as a response to integrated weed managment variables such as irrigation, fertilization, mowing and traffic. Herbicides will be evaluated in replicated trials for selective coontrol of important weeds.
Progress: During the life of this project turfgrass weed management systems were developed. Three sequential applications of the herbicide quinclorac (0.56 kg/ha) at 21 day intervals or a mixture of quinclorac at 0.8 kg/ha plus diclofop at 0.75 kg/ha applied twice provided 85 to 90% torpedograss (Panicum repens) control. Mowing just prior to quinclorac application did not reduce torpedograss control compared to a one week interval between mowing an application. In addition, level of nitrogen fertility had no impact on quinclorac activity. Trifloxysulfuron was evaluated for torpedograss, kyllinga and purple nutsedge (Cyperus rotundus) management in hybrid bermudagrass turf. Two sequential applications (0.022 kg/ha) of a sprayable formulation at 4 to 6 week intervals provided 80 to 90% control of all three species without causing injury to the turfgrass. Tropical signalgrass (Urachloa subquadripara), one of the most serious weed pests in Florida turfgrass, germinates best at pH 5 to 6, temperatures of 25 to 30 C and at water potentials >-0.04 Mpa. Tropical signalgrass shoots emerged from as deep as 6 cm with maximum emergence from seed placed on the soil surface. Tropical signalgrass emerged during mid-March in the field in central Florida when soil and ambient temperatures were 20 C. Postemergence herbicide treatments that are registered for use in St. Augustinegrass were ineffective for control of tropical signalgrass. Several Preemergence treatments, however, provided excellent control. These included prodiamine, dithiopyr, oryzalin, benefin + oryzalin or benefin + trifluralin. Tolerance of seashore paspalum (Paspalum vaginatum), a turfgrass species that tolerates high salt content in irrigation water, to standard turfgrass herbicides was detrmined. Seashore paspalum was not injured by preemergence applications of several dinitroaniline herbicides including prodiamine, pendimethalin and trifluralin. Postemergence treatments of quinclorac, metsulfuron, clopyralid, bentazon, halosulfuron, imazaquin, bromoxynil and metribuzin were also tolerated by seashore paspalum. Ethofumesate, asulam, sethoxydim, MSMA, imazapic and clethodim caused damage to the seashore paspalum. Experiments were conducted under greenhouse condition to evaluate the salt tolerance of eight weed species: torpedograss, dollarweed, Virginia buttonweed, large crabgrass, common bermudagrass, purple nutsedge, goosegrass, and Florida pusley to determine the potential for using saltwater for weed management in seashore paspalum. The weeds were subjected to five seawater concentrations: 34,000 ppm salt (1x), 25,500 ppm (3/4x), 17,000 ppm (1/2x), 8,500 ppm (1/4x), and untreated (0x). Crabgrass, common bermudagrass, and purple nutsedge were controlled 70% or greater by 1/2x or greater saltwater while dollarweed, Virginia buttonweed, goosegrass, and Florida pusley showed 70% injury at concentrations of 1/4x or greater. Torpedograss was not affected by any of the saltwater treatments.
Impacts: Quinclorac offers effective control of torpedograss when used in a series of sequential applications. Mowing and fertility level appear to have little impact on quinclorac activity. Trifloxysulfuron controls both torpedograss and purple nutsedge, two serious perennial weed problems in turfgrass. Information developed on tropical signalgrass germination and emergence can be used by sod producers to select proper timing of preemergence herbicide applications. Depth of emergence information suggests that deep turning of the soil will bury tropical signalgrass deeper than the 6 cm maximum depth of emergence, thus providing a potential management tool for this weed. For areas where seashore paspalum is grown, the use of saltwater for irrigation will also provide significant weed control and could reduce herbicide use on this turfgrass species by 25 to 50%.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-LAL-03571
Title: ***DYNAMIC ECONOMIC ANALYSIS OF THE FLORIDA CITRUS INDUSTRY***
Critical Needs:
National Goals: 1, 2
Key Themes: economics; fruit; citrus; economic analysis; computer analysis; international competition; world trade; supply and demand; investments; marketing strategies; simulation models; econometrics; policy analysis; expert systems
Summary: Will survey citrus industry for data and develop computer decision aids for citrus growers.
Progress: Compiled and published annual citrus comparative budgets for the three major citrus producing regions in Florida-Central Florida, Southwest Florida and Indian River(East Coast). Annual citrus caretaker custom rates were compiled and published for the Central Florida and the Indian River/South Florida production regions. Published updated comparative costs between Florida's and Sao Paulo's (Brazil) citrus industries. Developed and Excel computer decision aid for citrus growers to evaluate resetting/tree replacement strategies; computer program made available on Lake Alfred CREC Extension web page.
Impacts: Florida is the second largest citrus producing region in the world and the largest supplier of orange juice products to the U.S. market. Federal trade policy has focused on a 'Free Trade of the Americas Agreement' which has included discussions on reducing or eliminating the FCOJ import tariff. The loss of the FCOJ tariff would enable foreign citrus production (e.g., Sao Paulo-Brazil) to become more cost competitive and potentially reducing Florida citrus growers returns by $1.20 to $1.40 per box. Resetting/tree replacement costs average 13% of the total grove care costs for a citrus operation. The reset analysis computer program will enhance citrus growers tree replacement strategy decisions, and improve production efficiency and returns.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-LAL-03770
Title: ***ENVIRONMENTAL EFFECTS ON VEGETATIVE AND REPRODUCTIVE GROWTH OF CITRUS***
Critical Needs:
National Goals: 1, 4
Key Themes: citrus; environmental stress; plant physiology; radiation; temperature; soil plant water relations; fertilizers; soil plant nutrient relations; photosynthesis; crop yields; fruit quality; phytotoxicity; insect pests; plant diseases; environmental effects; humidity; plant biology; climate; data collection; decision making; production efficiency; stress tolerance; plant growth; mineral nutrition; gas exchange; environmental factors; rainfall; flowering; quantitative analysis; plant response
Summary: The Florida citrus industry annually produces more than 1 billion dollars worth of fruit. Sustantial production and quality losses result from biotic and or abiotic environmental stresses. For example, freeze damage, flooding, drought, salinity, diseases, and insects reduce productivity and quality of Florida citrus. The purpose of this project is to gain information that will be of use in minimizing tree stress and fruit loss thereby maximizing fruit quality while protecting the environment.
Progress: In N deficient citrus leaves, small chloroplasts had no starch granules, disintegrated grana and stroma lamellae that coincided with the accretion of numerous large plastoglobuli in the stroma. High N leaves had large chloroplasts with well developed grana, stroma lamellae and numerous large starch granules that apparently disrupted chloroplasts such that photosynthesis was no greater than in high n leaves than in moderate N leaves. Fifty percent shade cloth and kaolin particle film reduced midday leaf temperature and leaf-to-air vapor pressure difference such that stomatal conductance and photosynthesis were increased above that of sunlit leaves. Photoinhibition of photo system II was greater in sunlit than in shaded leaves so non-stomatal factors were more important than stomatal limitations on photosynthesis during radiation and high temperature stress. Diaprepes root weevil populations were correlated to flooding stress and soil pH in the field. Citrus seedlings that were previously stressed by flooding were

more susceptible to Diaprepes root weevil feeding than non flooded seedlings. In Spring navel orange trees, the presence of a normal fruit load resulted in lower foliar carbohydrate concentrations and higher rates of photosynthesis than in leaves of de-fruited trees. A new Citrus Flowering Monitor Expert System was tested for the second year and performed well to predict flowering intensity and dates of bloom for all citrus districts in Florida. In most years in Florida, multiple bloom waves occur within the normal bloom period from February to April. Three times more flowers occur per summer compared to a spring shoot.
Impacts: Work under this project allows Florida growers to better adjust their production practices to the various biotic and abiotic factors that impact citrus trees and their fruit development. A better understanding of the physiological behavior of citrus under Florida conditions also furthers our basic understanding so that progress can be made in overcoming adverse environmental conditions.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-LAL-03788
Title: ***DEVELOPMENT OF ECOLOGICAL METHODS FOR NEMATODE MANAGEMENT***
Critical Needs:
National Goals: 4
Key Themes: nematodes; nematode ecology; nematode control; sustainable agriculture; cropping systems; integrated pest management; nematode population; crop rotation; cover crops; water management; plant nutrition; plant nematode relations; plant nematode resistance; solarization; vegetables; fruit; ornamentals; population control; community structure
Summary: Field, laboratory, and greenhouse studies will be used to develop and integrate methods for managing and minimizing nematode impact on vegetable, fruit, and ornamental crops. Methods investigated will include cropping systems, cover crops, rotation crops, plant tolerance, solarization, and other novel methods.
Progress: Extensive field research studies were conducted to explore and define alternative hosts, new nematode field monitoring systems, chemical and nonchemical nematode management tactics, chemical application technologies, and treatment regimes to serve as alternatives to soil fumigant uses of methyl bromide. Based on overall summary of repeated field and microplot trials during 2003, Telone C-35 proved to be the only commercially available fumigant compound which demonstrated consistently excellent nematicidal, herbicidal, and fungicidal activity, and produced tomato or strawberry yields equal to that of methyl bromide. Rather than soil sampling, the results of 10 field studies and sampling simulation analyses showed that the use of root galling indices of crop plants acquired systematically from grower fields after final harvest of the crop can be used to accurately characterize root-knot nematode (Meloidogyne spp.) infestation level and for revealing patterns of in-field distribution. Eight field research studies demonstrated that the weed host range of the root-knot nematode is extremely broad, and nematode population growth is functionally related to the density, diversity, and root biomass of the weed species present in a field, and that root-knot nematode cannot be effectively managed unless weeds are also effectively and simultaneously managed in the field. Three field studies demonstrated that changes in soil bulk density with depth could have significant but differential impact on movement and efficacy of soil fumigant nematicides.
Impacts: During 2003, significant refinements were made in soil application technologies of methyl bromide alternative fumigants to help resolve persistent problems of application uniformity and performance inconsistency. Studies involving new IPM field monitoring protocols for nematodes and nematode x weed interactions have contributed significantly to the development of an integrated, multi-tactic, pest and crop management system to replace methyl bromide.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-LAL-03897

Title: ***SOIL MICROBIAL TAXONOMIC AND FUNCTIONAL DIVERSITY AS AFFECTED BY LAND USE AND MANAGEMENT***
Critical Needs:
National Goals: 1, 4
Key Themes: phosphorus; soil microorganisms; land use; mycorrhizae; arbuscular (fungi); diversity; fertility; taxonomy; land management; citrus; production management; management systems; soil fungi; symbiosis; hyphae; microbial ecology; proliferation; roots; cropping systems; fertilizer application; soil fertility; soil plant nutrient relations; plant growth; growth response; soil structure
Summary: Arbuscular mycorrhizal fungi (AMF) are a major determinant of plant growth response in a crop soil. The function of mycorrhizas in crop growth under high P fertility is not established. The purpose is to establish the impact of mycorrhizas on crop growth under high P fertility.
Progress: Loss of productive capacity of sugarcane in the first year after successive planting is a widespread problem in sugarcane worldwide. Fallow management of sugarcane soils by repeated tillage to break up the root crown and to reduce weed cover before replanting produces up to a 30% increase in biomass at the first cutting, but only a slight response in the second cutting and no response in the third cutting. Soil treatment with methyl bromide duplicates the fallowing effect. No soil microorganisms deleterious to sugarcane roots have been identified in most instances. Several AMF were trapped from successively planted fields in South Florida, and three Glomus isolates were selected to reconstitute a steamed local Tory muck soil in glasshouse experiments. Roots emerged from sugarcane seed pieces and only those in non-steamed soil were rapidly colonized in advance of shoot development. Colonization rate varied with Glomus isolate in reconstituted soils. Shoot growth rate was inversely related to colonization rate among soil and Glomus isolate treatments. Depression of biomass gain compared to the steamed soil treatment was best predicted by root colonization at 2 weeks and to a lesser extent by later colonization. Results suggest that early colonization of sugarcane roots before shoots emerge produces a carbon cost that isn't recoverable by the first cutting. This hypothesis will be tested in fallow field plots reconstituted with native AMF.
Impacts: Roots of crop plants become colonized by AM fungi to different extents depending on climate, soils, cropping practices and fertilizer history. The impact of mycorrhizas on crop growth under high P fertility is not established. Therefore, the primary objective is to evaluate the rate and extent to which AM fungi isolated from crop soils colonize roots. The secondary objective is to determine how this colonization affects plant growth, carbon status and nutrition at soil P availability levels that have accumulated after fertilization of crop fields.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-LAL-04057
Title: ***CITRUS BY-PRODUCTS AND PROCESSING TECHNOLOGY DEVELOPMENT***
Critical Needs:
National Goals: 1
Key Themes: waste utilization; citrus; byproducts; food processing; new technology; process development; food engineering; food products; new products; product development; extraction; food safety; recovery; documentation; performance evaluation; costs; terpenes; residues
Summary: Value-added by-products research requires strong product utilization and processing industry support to maintain industry prominence in International markets. By-products research allows development of processing and utilization schemes to profitably deal with waste utilization, rather than pay disposal costs.
Progress: Important issues of properly defining flavor, acknowledgement of potential safety and handling problems of minimally processed juices and understanding large-scale efficiencies of current thermal processing regimes must be considered before embracing high pressure, pulsed electric fields or unpasteurized juice technologies. Three terpene chlorohydrins found in cold-pressed orange essential oils were isolated and identified and related to the use of chlorinated water in the oil recovery process. The

compounds arise as a result of reaction of chlorinated process water with d-limonene in the oil. NMR analysis indicated that the major chlorohydrin present was the diequatorially substituted (1R, 2R, 4R)-2-chloro-8-p-menthen-1-ol. Presence of these compounds in oils has economic significance for the use of the oils as flavoring agents. Removal of chlorine from the water by carbon filtration prevented the formation of these compounds as a result of manufacturing cold-pressed oils. The impact of flavor fractions recovered from oranges and used for juice manufacturing on Salmonella viability was investigated. A five-strain cocktail of salmonellae was challenged with a single-fold cold-pressed peel oil (CPO), a five-fold CPO, a terpeneless CPO and an aqueous orange aroma stored at 4 C and 25 C. In most cases, a biphasic cell die-off occurred such that an initial, rapid population decline preceded a more gradual reduction in cell populations. Results indicate that the test compounds possess substantial antimicrobial activity and can cause population reductions greater than the 5-log10 performance standard required by the FDA juice HACCP rule (21 CFR 120). In general, antimicrobial activity of the test substances followed the order: terpeneless CPO > five-fold CPO > single-fold CPO > aqueous aroma.
Impacts: Research and survey work from the produce industry, including Florida, was gathered, reviewed and summarized into workbook and checklist form (see citation below). Specifically, food models systems, including citrus, produce, juice, beverages, by-products were discussed in the context of how recalls, market withdrawals and other mitigation activities might be conducted.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-MCS-03861
Title: ***GENETIC ENGINEERING OF ZYMOMONAS MOBILIS FOR FUEL ETHANOL PRODUCTION***
Critical Needs:
National Goals: 1
Key Themes: bacterial genetics; genetic engineering; ethanol; fuel; molecular biology; restriction enzymes; endonucleases; enzyme modification; methyl transferases; methylation; nucleosides; electroporation; transformation; production efficiency; gene cloning; gene expression; escherichia coli; strains (genetics); process development; optimization; gene transfer
Summary: Genetic manipulations to improve ethanol production in Z. mobilis are complicated by enzymes that prevent introduction of foreign DNA into the bacteria. The purpose of this project is to determine the factors that limit the efficiency of transfer of foreign genes into Z. mobilis and to produce new strains which will be more amenable to genetic engineering which may be used to enhance their fuel ethanol production.
Progress: The previously cloned CcrM-like methylase gene was examined to determine if it exhibited a cell cycle regulation activity in Z. mobilis as has been reported in other bacteria. To express the CcrM methylase at a higher than normal level in Z. mobilis, the CcrM gene was cloned behind the pBR322 rop gene promoter in the previously described plasmid (pBR-oriV) with a RSF1010 origin of replication. The construct was electroporated into Z. mobilis CP4 containing pLOI1844, a helper plasmid with the RSF1010 replication genes. The additional copies of the CcrM gene caused little if any change in growth rate, but did cause morphological changes in a subpopulation of the cells. The morphologically abnormal cells varied in diameter and were highly elongated, up to 30-fold longer than control cells. The elongated cells contained multiple DAPI-staining, nucleoid regions that were not separated by septa. New constructs with the CcrM gene behind Z. mobilis promoters are being prepared to attempt to vary the CcrM gene expression and determine its effect on cell growth rates and cell morphology. To purify and study the properties of the CcrM methylase in vitro, a variety of vectors and hosts were examined to determine the optimal combination for the expression of CcrM in E. coli. Of the combinations tested, the best expression of the CcrM methylase was achieved in E. coli strain HMS174 with the CcrM gene in the pET24b vector. Fractionation protocols to purify the HIS-tagged CcrM methylase are being examined to determine conditions required to purify the protein in order to study its properties in vitro. The pBR-oriV plasmid with a RSF1010 origin of replication is useful in the transfer of genes into Zymomonas if a

helper plasmid containing the RSF1010 replications genes is present. A transposon was constructed to integrate the RSF1010 replication genes into the genome of Zymomonas and other bacterial species to eliminate the need for a helper plasmid and to improve the general usefulness of pBR-oriV. The promoterless chloramphenicol gene with a synthetic consensus promoter (pSYN) from pLOI204 and the RSF1010 replication genes from pLOI1844 were cloned into an EX::TN pMOD vector (Epicentre). The insert with the transposon mosaic end sequences was PCR amplified, combined with the transposase and transferred into Z. mobilis CP4 by electroporation and chloramphenicol-resistant recombinants selected. This transposon, containing the RSF1010 replication genes, can potentially be transferred into a variety of gram-negative bacteria to allow the transfer of genes in pBR-oriV plasmids from one species to another.
Impacts: Two potential restriction endonuclease genes have been cloned from Z. mobilis. Inactivation of these genes may greatly enhance the ability to transfer of foreign genes into Z. mobilis to convert the organism into a more useful biocatalysts in exploitation of potential renewable energy sources for fuel ethanol production. The experimental approach developed in this study for the enhancement of the genetic manipulation of Z. mobilis should provide a general approach to modify and improve the genetics of other organisms that may be useful in generation of energy sources or organic substrates from renewable resources.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-ONA-03726
Title: ***EVALUATION OF FORAGE GERMPLASM AND FORAGE MANAGEMENT PRACTICES***
Critical Needs:
National Goals: 1
Key Themes: forage; germplasm; environmental factors; pasture management; livestock; grazing management; pasture weed control
Summary: Little or no forage production is obtained from tropical forages durring cool season. This project examines the selection and management of warm season grasses that produce forage during both the warm and cool season
Progress: A 3-yr split plot experiment was conducted to determine effects of rhizoma peanut (Arachis glabrata) entries and stubble height (SH, 2.5 and 10 cm) on dry forage mass, persistence, and nutritive value. Annual yield was higher for the 2.5-cm stubble (11.6 Mg/ha) than 10-cm (7.7 Mg/ha). However, most entries harvested at 2.5 cm and exposed to periodic flooding died, but showed good persistence at the 10 cm SH. No difference was found in CP (180 g/kg) and IVOMD (693 g/kg) between SH, pooled over years. A split plot experiment to evaluate mowing (mature and 35-cm regrowth) and hexazinone rate (0, .56, .84, 1.12, 1.40, and 1.68 kg ai/ha) on giant smutgrass (Sporobolus pyramidalis) control was conducted over 2 yr. Application of 1.12 kg/ha hexazinone provided 88% smutgrass control 365 DAT. Hexazinone applied at 35-cm regrowth, had no additional control over mature treatments. A factorial combination of four N (N0-N255 = 0, 85, 170, 255 kg/ha, respectively) and S levels (S0-S285 = 0, 95, 190, 285 kg/ha, respectively) was applied to bahiagrass (Paspalum notatum) over 3 yr. In the absence of N, yield and N concentration in forage increased with increasing rates of S fertilizer, but as level of N increased, these three responses to S diminished to nothing. With N0, yield ranged from 1140 to 2640 kg dry matter (DM)/ha over S0 to S285, but with N255, yield ranged from 3350 to 3250 kg DM/ha. Up to 80 kg N/ha/yr came from apparent mineralization of soil organic matter as a result of addition of S to plots that received no N. Concentrations of S in forage ranged from 2.6 to 3.8 g/kg with S0 to S285, and maximum annual uptake was 28 kg S/ha with recovery of applied S at 136 g/kg. Soil in five bahiagrass pastures was sampled for germinable seed in central Florida prior to summer rains in February 2002. Over all pastures, there was an average 9391 germinable seed/m2 representing 48 species plus the combined Cyperaceae and Juncaceae, which constituted the largest entity with an average 6518 seed/m2. Bahiagrass ranked 3rd in density of germinable seed with an average 566 seed/m2 (equivalent of 17.2 kg seed/ha). Aeschynomene evenia seed ranked 5th in density with 52, 553, and 335 seed/m2 in 1, 5, and 10-yr-old stands, respectively (2.8, 29.7, and 18 kg seed/ha). Density of A. americana (rank 13) and Desmodium

heterocarpon (rank 6) averaged 124 and 857 seed/m2, respectively (6.7 and 11.2 kg seed/ha). A 4-yr grazing study compared creeping signalgrass (Brachiaria humidicola) and bahiagrass. Grazing for Brangus cows and calves began in mid-May, calves were weaned the first week in August, and cows remained on pasture through October. Cattle were stocked at 2.5 pair/ha and grazed in a 28-d, 4-pasture rotation. At weaning, calves on signalgrass averaged 249 vs. 236 kg for bahiagrass at 266-d of age. Cows averaged 514 kg in May and weighed 520 kg on signalgrass and 496 kg on bahiagrass in August. In October cows averaged 563 kg on signalgrass vs. 516 kg on bahiagrass with a body condition score of 5.7 and 4.7, respectively.
Impacts: There is a major need to select and develop persistent, long-lived grasses and legumes for Florida's poorly-drained soils. Successful legume production increases forage nutritive value and reduces fertilizer nitrogen application, saving growers millions of dollars.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-PLP-03524
Title: ***IDENTIFICATION, MANAGEMENT, AND CONTROL OF VIRUSES INFECTINGNG ORNAMENTAL AND RELATED CROPS***
Critical Needs:
National Goals: 1
Key Themes: ornamental plants; plant diseases; virus diseases (plants); foliage plants; orchidaceae; plant disease control; planting stock; plant pathogens; pathogen identification; virus identification; virus characterization; virus detection; cost effectiveness; aroids; gladiolus; lilium
Summary: To identify and characterize important viral pathogens, develop effective means for detecting them, and to implement commercially feasible strategies for their control.
Progress: A caladium isolate of DsMV was cloned as cDNA from genomic RNA extracted from purified virions, and the sequence of the 3 prime-terminal 3158 nucleotides was determined. Phylogenetic alignment of the CP sequences indicated that DsMV is closely related to members of the bean common mosaic Potyvirus subgroup. The CP gene was amplified by polymerase chain reaction from plasmid DNA and subcloned into an expression vector. The recombinant CP thus obtained in E. coli was used as an immunogen for antiserum production. Direct tissue blot (DTB) and ELISA techniques were used to ascertain distribution of dasheen mosaic potyvirus (DsMV) in certain varieties of caladium (Caladium hortulanum) plants. DsMV, detected in tubers of all tested, was not found in all petioles or leaves. Similar studies with lily symptomless carlavirus revealed much high titers in lily corm tissues than in above ground plant parts. DTB techniques were applied for the detection of cucumber mosaic virus (CMV) in gladiolus corms. While positive antibody-virus reactions were observed in all CMV-infected tissue, none were observed in blots of healthy tissue. Corm tissue was more reliable than leaf tissue for detecting this virus. Cymbidium mosaic potexvirus and odontoglossum ringspot tobamovirus was detected in all 18 orchid collections surveyed in 1998-1999. Cymbidium ringspot tombusvirus, however, was not detected in any of the 420 plants tested. The presence of lily X potexvirus in the United States was confirmed.
Impacts: Obtaining viable DsMV antiserum will facilitate efforts to detect this virus in various commercially grown aroids, especially foliage aroids, such as dieffenbachia and caladium. Direct tissue blot studies involving viruses of aroids, lilies, and gladiolus provide valuable information regarding which tissues to index when attempting to determine whether or not plants are infected with any of the aforementioned viruses. Repeated efforts to find any orchids, wild or cultivated, infected with cymbidium ringspot tombusvirus failed. Either this virus is extremely rare in orchids or, contrary to its name, it does not infect orchids.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-PLP-03586
Title: ***THE EPIDEMIOLOGY AND CONTROL OF STRAWBERRY DISEASES***

Critical Needs:
National Goals: 1, 2
Key Themes: plant diseases; fruit; plant disease control; strawberries; post harvest; epidemiology; integrated control (diseases); fungus diseases (plants); colletotrichum; botrytis cinerea; phomopsis; shelf life; field studies
Summary: A. Postharvest decays make strawberries extremely perishable. B. Field practices affect how well strawberries resist decay pathogens. A. Applications of fungicides will be examined for their effect on decay incidence in storage. B. Field sanitation and other cultural practices will be examined for effect on postharvest decay.
Progress: Fungicide sprays and cultivar selection enhanced the shelf-life of Florida-grown strawberries. Camarosa fruit had much less decay in storage than did Sweet Charlie. An 8-h delay in forced-air cooling did not lead to increased decay when compared with the standard 2-h delay unless field temperatures exceeded about 28 C. The rate of increase in Botrytis fruit rot in stored fruit ranged from 0 to 2.25% per day. Fruit from unsprayed plots became diseased earlier than those from fungicide treated plots, but the rate of increase during the epidemic was similar.
Impacts: Should lead to better more efficient handling of strawberries.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-PLP-03588
Title: ***SANITATION IN POST HARVEST HANDLING PRACTICES FOR FRESH FRUITS AND VEGETABLES***
Critical Needs:
National Goals: 1, 2
Key Themes: fruit; vegetables; food; fresh produce; post harvest losses; handling systems; food handling; sanitation; food safety; packinghouses; food packing; disease control; food quality; quality maintenance; chlorination; tomatoes; bacterial contamination; washing; food microbiology; cleaning agents
Summary: Postharvest pathogens accumulate at sites where fruits and vegetables are packaged. Water used to wash or handle freshly harvested fruits and vegetables may contaminate them with harmful microbes. The project explores ways to prevent the accumlation of pathogens at packinghouses. Various methods to sanitize wash or handling water will be explored.
Progress: Tests with a simulated, scale model flume confirm that chlorinated water (150 to 200 ppm, pH 6.0 to 7.0, 24 C) will prevent cross contamination (movement of bacterial cells or fungal spores from a source to potential infection courts such as wounds). Hydrogen peroxide (27 ppm), peroxyacetic acid (80 ppm) and solutions of chlorine dioxide (5 ppm) did not prevent cross contamination. Gas phase chlorine dioxide was more effective in preventing decay development at inoculated wounds than were 30-sec washes in chlorinated water (100 ppm, pH 6.5). The cardboard of standard tomato boxes was a significant sink in gas phase chlorine dioxide treatments.
Impacts: Water chlorination remains the best way to achieve sanitation in water handling systems in tomato packinghouses. The proposed alternatives to chlorine were not effective.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-PLP-03603
Title: ***ENHANCING THE SUSTAINABILITY OF COMMERCIAL PEANUT PRODUCTIONTHROUGH IMPROVED DISEASE MANAGEMENT***
Critical Needs:
National Goals: 1, 4
Key Themes: plant diseases; sustainable agriculture; integrated pest management; plant disease control; peanuts; agricultural economics; economics; cultivars; breeding lines; plant introductions; plant disease

resistance; integrated control (diseases); economic analysis; cost benefit analysis; biological control (diseases)
Summary: Plant diseases of peanut are the major limiting factor in Florida for yield. The purpose is to create a system of tactics that will minimize damage from plant diseases for the minimum cost for the grower.
Progress: During this project from Oct 1997 to Sept. 2002, I evaluated several tactics to control peanut leaf spots (Cercosporidium personatum and Cercospora arachidicola), rust (Puccinia arachidis), white mold (Sclerotium rolfsii), cylindrocladium black rot (CBR, Cylindrocladium parasiticum), and tomato spotted wilt virus. I evaluated cultivars, breeding lines, and fungicides to locate the most effective techniques for reducing disease. Collaboration with Dr. Dan Gorbet was done so that the ultimate result would include commercially acceptable cultivars. Collaboration with commercial companies was also done so that the fungicides that were evaluated would likely be legally labelled. Cultural controls such as crop rotation, planting date, and seeding rate were factored in when transfering the data to commerical situations. Resistance to CBR was found in several breeding lines developed by Dr. Gorbet. Dramatic differences among the cultivars and breeding lines were assessed in my field tests in Santa Rosa County. Also, several commercially available cultivars were found to have useable resistance to CBR for the first time in my program. In some years, tomato spotted wilt virus was present and comparisons among breeding lines and cultivars for this viral disease were also made. Control of leaf spots, rust, and white mold were done each year and during the period of this project, fungicides were evaluated on a susceptible cultivar (Florunner) and a partially resistant cultivar (Georgia Green). Also, all such data was evaluated using an economic analyses that related dollars expended to dollars gained. Interestingly, the partial resistance of Georgia Green to white mold minimized the returns to $0.61 to $3.01 per dollar spent. On the susceptible cultivar, the returns were as high as $7.36 and $8.31. For leaf spot and rust, the dollar returns were consistently high on both the resistant and susceptible cultivars. The average returns for the susceptible cultivar ranged from $7.88 to $11.90 and for the partially resistant cultivar the range was from $4.70 to $7.80. This allowed for manipulations within spray programs to further increase profit when resistant cultivars are used.
Impacts: Two cultivars with resistance to Cylindrocladium black rot, Hull and Carver, were released by Dr. Dan Gorbet in 2002. In my field tests they were evaluated for resistance to CBR as breeding lines. They will allow for reduced fungicide sprays. Dollar returns for dollars expended can be maximized for fungicidal control of leaf spot by the grower with designated spray programs I employed.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-QUN-03609
Title: ***INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS***
Critical Needs:
National Goals: 1
Key Themes: ornamental plants; floriculture; woody plants; landscape plants; native plants; wild flowers; native grasses; annual plants; perennial plants; foliage plants; screening systems; plant breeding; plant genetics; plant introductions; plant evaluation; new varieties; information collection; information dissemination
Summary: Use of herbaceous native plants is increasing; however, there is little information about the adaptability of these species to landscape or roadside situations. Appropriate seed sources are lacking. Florida ecotypes of herbaceous native plants will be evaluated (growth and physiology) under landscape and roadside conditions. Seed of Florida ecotypes of herbaceous native plants will be increased.
Progress: NORCINI-In general, Florida ecotypes of native wildflowers are more sustainble than plants derived from nonFlorida seed sources. Statewide evaluation of several southeastern U.S. accessions of Trifolium reflexum showed that this species perform best in the Florida panhandle. Muhlenbergia capillaris and Tridens flavus were the top performers in a 3-yr evaluation of several native and nonnative ornamental grown under low input landscape conditions in northern Florida. Imazapic is least phytotoxic

to native wildflowers, regardless of seed source, when applied prior to wildflower seed germination. KNOX- New multi-site evaluation plantings were established for 10 Nandina domestica taxa, 20 Camellia spp. taxa, 25 taxa of ornamental grasses and 32 new taxa of Lagerstroemia spp. Ongoing, long-term evaluation of Lagerstroemia cultivars is indicating those cultivars that perform well in north Florida. To date, this information has been disseminated through conferences and extension outlets. Evaluation of Magnoliaceae taxa has identified superior cultivars for USDA Zone 8 (Gulf Coast). Two of these taxa have been distributed through USDA SERA-IEG 27 for evaluation throughout the southeast U.S.
Impacts: NORCINI-Native wildflowers plantings derived from seed collected from native Florida populations not only should be less costly to maintain over the long term because they are sustainable but also helps to preserve natural resources and enhance roadside and natural habitats. KNOX- Plantings of Lagerstroemia cultivars, large-flowered deciduous Magnolia cultivars and other trees and shrubs were established for long-term evaluation of growth, flowering, pest resistance and other ornamental characteristics. Results of these evaluations are helping consumers and the nursery and landscape industries select the best species and cultivars for production and landscape use in Florida.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-QUN-03693
Title: ***DYNAMIC SOYBEAN INSECT MANAGEMENT FOR EMERGING AGRICULTURAL TECHNOLOGIES AND VARIABLE ENVIRONMENTS***
Critical Needs:
National Goals: 1
Key Themes: baculovirus; biological control; integrated pest management; polymerase chain reaction; genetic differences; insect predators; entomopathogens; transgenic plants; soybean; entomology; insect ecology
Summary: The introduction of transgenic varieties requires that new information is needed to evaluate the effectiveness of natural enemies in suppressing pest insect populations. This project is to develop new efficient methods for studying the effects of natural enemies on soybean insect pests.
Progress: Anticarsia gemmatalis, Pseudoplusia includens, and Plathypena scabra are pests that form a leaf-feeding guild in soybean. Soybean is relatively tolerant to leaf consuming insects, and numerous natural enemies are important in preventing pest outbreak. Studies were completed that evaluated the accuracy and efficiency of estimating defoliation in soybean. Molecular techniques were developed to detect species and strains of baculoviruses that infect leaf-feeing pests in soybean. The techniques were used to determine spread of the viruses through soybean by predator populations. They also were used to determine persistence of the viruses on the plants and in the soil. Epizootics of the entomopathogen Nomuraea rileyi are typical on late-season populations of leaf-feeding pests of soybean. Molecular techniques were used to compare strains of the fungal pathogen as influenced by geographic location and host species. Geographical variation was found, but the population was stable over a multiseasonal time-frame within a given location.
Impacts: The studies resulted in the development of efficient and reliable methods for estimating defoliation in scouting and research programs. Outbreaks of defoliating pests are rare in soybean. An understanding of the genetics and epizootiology of the entomopathogens is useful in biological control in integrated pest management programs of soybean.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-QUN-03706
Title: ***REPRODUCTIVE BIOLOGY AND GAMETOPHYTIC SELECTION IN HIGHER PLANTS***
Critical Needs:
National Goals: 1

Key Themes: plant improvement; plant reproduction; gametophytes; selection; tobacco; pollen germination; alfalfa; selection; pollutants; pollen; corn; oilseeds; tomatoes; sesame; pollen tubes; plant physiology; genetic engineering; bioassays; pollen germination; plant biochemistry; environmental effects
Summary: An understanding of plant reproductive biology is essential so that the genetic influence on physiological processes can be assessed, appropriate strategies involving manipulation of genetic transmission can be developed and gametophytic systems can be adapted for pollutant assays. All aspects (pollen diameter, in vitro and in vivo pollen germination and tube growth, stigma and style biochemistry and physiology, temperature effects on these variables) of the reproductive biology in various model species (corn, sesame, tomato) will be examined.
Progress: An understanding of plant reproductive biology is essential so that; (1) the genetic influence on physiological processes can be accurately assessed; (2) appropriate strategies involving manipulation of genetic transmission can be developed; (3) this information can be utilized in applied plant improvement programs; and (4) gametophytic systems can be used as a rapid and efficient method to assay air and water pollutants; All aspects (pollen diameter, in vitro and in vivo pollen germination and tube growth, stigma and style biochemistry and physiology, temperature effects on these variables) of the reproductive biology on various model test species (corn, sesame, tomato) have been explored in this project over the 5 years this project has been active resulting in 11 referred journal articles, 7 abstracts given at national and international symposia and the training of 3 graduate students (both at the M.S. and Ph.D.).
Impacts: The accumulation of the information generated by reproductive biology studies conducted in this project and other national and international centers, have generated many practical applications including gametic selection for herbicide resistance (corn), selection for vigorous progeny by selection of the most competitive male gametes in genetically diverse pollen populations (corn), and selection for low temperature tolerance (tomato).
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-QUN-03854
Title: ***SELECTION AND ADAPTATION OF GRASS AND LEGUME SPECIES FOR FORAGE PRODUCTION IN THE SOUTHERN COASTAL PLAIN AND PENISULAR FLORIDA***
Critical Needs:
National Goals: 1
Key Themes: photoperiod; forage; setaria; paspalum; paspalum notatum; plant adaptation; selection systems; forage grasses; regional research; forage production; coastal plains; plant genetics; germplasm; plant evaluation; plant breeding; plant improvement; forage yields; plant pest resistance; transgenic plants; plant response; seasonal growth; plant growth; plant accessions; festuca arundinacea; endophytes; forage persistence; clover; lolium; soybeans; forage legumes; grazing
Summary: The forage production in the southern Coastal Plain and Peninsular Florida is severly limited in the fall of the year. Efforts through plant breeding to develop varieties to fill this void would be advanageous to livestock production in this region. The purpose of this project is to integrate research with a number of plant breeding programs in the southeastern U.S. to cooperatively address fall season forage production constraints. Concentration on breeding for physiological traits, specifically photoperiod, will be the major focus of this project.
Progress: Photoperiod insensitive, cold adapted (PICA) Cycle 4 (diploid, 2X)forage and turf populations were evaluated at the Range Cattle REC, Ona, at the NFREC, Marianna, and at the CPES, Tifton, GA. Ramets have been selected from these populations for resistance to fungal disease and improved forage or turfgrass characteristics and are being polycrossed in the greenhouse at Marianna during winter 2003-2004 to produce PICA Cycle 5. Plans for 2004 include testing the yield and survival of Cycle 5 plants in 2004 in TX, LA, FL, and GA. New sexual polyploidy (tetraploid, 4x) bahiagrass plants were developed by using colchicine, trifluralin, and oryzalin to double the chromosome numbers of diploid bahiagrass in Gainesville. These new genotypes were evaluated for several morphological features. Crosses have been made with 50 verified tetraploid plants (selected from this doubled-diploid material) with Argentine,

Paraguay 22, Tifton 7 and Claudina bahiagrass at the NFREC-Quincy during 2003. Research to evaluate leaf tissue reaction to frost and freezing in bahiagrass has identified leaf anatomical structures possibly involved in tolerance. Crosses were made between freeze resistance and susceptible bahiagrass genotypes to evaluate the inheritance of this characteristic. Efforts to continue to monitor mole cricket pests of bahiagrass continue. Several new mole cricket pit-fall traps were installed in Escambia and in Madison counties in Florida in 2003 to increase sites for monitoring the mole cricket distribution in the Florida Panhandle. This is part of a current research project to introduce Steinernema scapterisci, a biological control nematode for mole cricket, into bahiagrass pastures in north Florida. New Paspalum species were evaluated for winter survival, frost tolerance, forage yield, forage quality, and seed production at Marianna, Ona, Brooksville, and Live Oak, FL. Three bahiagrass and two Paspalum nicorae plant introductions have performed well at most locations. Further evaluation of these introductions will be conducted to determine their usefulness for forage or turf. Experimental lines of rye, ryegrass, wheat, and oats were tested at the NFREC-Marianna. Results from these yield trials were reported in NFREC research report format and on the web at the Georgia Variety Testing site (http://www.griffin.peachnet.edu/swvt/). One oat, two triticale, and two rye cultivars were released by FAES in 2003. Three breeders seed increases of forage soybean experimental lines were grown and harvested in cooperation with the Florida Seed Producers Inc. during summer 2003. A preliminary study evaluated annual peanuts as a forage crop for cattle. Initial composition of the peanut, including crude protein, ADF, NDF, and lignin was determined, along with yield. The peanuts initially were an excellent forage for grazing, but the lack of adequate regrowth resulted in poor animal performance late in the grazing period. A 2-year study evaluated prepared seedbed vs overseeding winter forages on bahiagrass pasture. The results indicate that under dryland conditions, cultivation method may impact availability of cool season forage in the southern Coastal Plain.

Impacts: This project fosters forage plant research and breeding improvement for the southern Coastal Plain and Peninsular Florida. Collaborative efforts will increase profitablity of livestock enterprises in the region through new research on improving forage management and releases of new cultivars. Cultivars and germplasm resulting from this collaborative work, released in 2003, include FL-SYNT tetraploid spring rye, 2003 (germplasm). R.D. Barnett, A.R. Blount, and P.L. Pfahler. FL91142-A19 triticale, 2003 (cultivar). R.D. Barnett, A.R. Blount, P.L. Pfahler, J.W. Johnson, B.M. Cunfer, G.D. Buntin, and D. Bland. FL94128-Y1-A8 triticale, 2003 (cultivar). R.D. Barnett, A.R. Blount, P.L. Pfahler, J.W. Johnson, B.M. Cunfer, G.D. Buntin, and D. Bland. FLNF94 Sel rye, 2003 (cultivar). R.D. Barnett, A.R. Blount, P.L. Pfahler, J.W. Johnson, B.M. Cunfer, G.D. Buntin, and D. Bland. FLPL97P20 rye, 2003 (cultivar). R.D. Barnett, A.R. Blount, P.L. Pfahler, J.W. Johnson, B.M. Cunfer, G.D. Buntin, and D. Bland. FL9708-P37 oat, 2003 (cultivar). R.D. Barnett, A.R. Blount, P.L. Pfahler, J.W. Johnson, B.M. Cunfer, G.D. Buntin, and D. Bland.

Source of Federal Funds: Hatch

Scope: Integrated

Project Number: FLA-QUN-04012

Title: ***BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES***

Critical Needs:

National Goals: 4

Key Themes: biological control (insects); insect control; tomatoes; peppers; cabbage; melons; cultural control (insects); integrated pest management; insecticides; insect pests; economic thresholds; insect biology; insect ecology; vegetables; estimation; monitoring; insect population; crop production; environmental impact; risk management; plant disease control; disease transmission; economic analysis; comparative analysis; educational materials; extension; information dissemination

Summary: Insect and the diseases they transmit are serious problems on vegetable crops. Growers rely on high-risk insecticides for controlling these pests, because sound economic thresholds and reduced-risk tactics with sound economic and environmental benefits have not been developed. This project examines

the environmental and economic benefits of reduced-risk tactics for managing these pests. Additional studies evaluate the ecology of pests and the impacts of their damage to crops.
Progress: A randomized complete block experiment was conducted to evaluate the benefits of UV-reflective mulch and reduced-risk insecticides in reducing Bemesia argentofolii populations in tomato and to determine the impacts of each tactic on natural enemy populations. Populations of the pest were greatly reduced by the UV-reflective mulch and the insecticides. Parasitoids provided little natural control, parasitizing less than one percent of the nymphs and pupae in all treatments. The entomopathogen Paecilomyces primarily infected populations of adults. Little infection was noted in the nymphs. Although populations of the pest greatly exceeded the recommended thresholds, effects on fruit quality were not significantly affected by reductions in populations by the UV-reflective mulch or insecticide treatments. Thripinema fuscum is an important natural enemy of Frankliniella fusca. Laboratory experiments were conducted to determine the reproductive biology of T. fuscum as affected by gender and stage of development of the host and to determine the effects of parasitism on host longevity, fecundity, and mortality. The adult females of F. fusca were the most readily parasitized in the laboratory experiments followed by the second instars, the first instars, and the adult males. One generation of T. fuscum developed within the parasitized larvae and adults, with the males and females emerging as fourth-stage juveniles from the host only during the adult stage. Parasitism did not cause mortality of the host. Parasitism significantly affected male longevity but not the longevity of females. The adult females that were parasitized as first or second instars did not lay eggs, and the adult females stopped laying eggs within three days of being parasitized. The female to male sex ratio of T. fuscum emerging from parasitized male and female F. fusca was 21.6 and 18.3 to 1, respectively. Significantly more T. fuscum emerged from female hosts than from male hosts. Significantly more emerged from hosts parasitized as larvae compared with hosts parasitized as adults, but the intrinsic capacity of increase of T. fuscum was greater when parasitizing the adult males and females. The intrinsic capacity of increase of T. fuscum is greater than the intrinsic capacity of increase of F. fusca, and this explains its ability to suppress F. fusca populations.
Impacts: These tactics are highly efficious and they are being implemented by growers as economical and efficacious against vegetable insect pests and the viruses they vector.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-SWS-03711
Title: ***TURFGRASS FERTILITY MANAGEMENT AND ENVIRONMENTAL IMPACT***
Critical Needs:
National Goals: 4, 5
Key Themes: soil fertility; turf grasses; plant nutrition; nitrogen; phosphorus; water contamination; groundwater; soil amendments; topdressing; composts; environmental impact; cynodon dactylon; lolium; nutrient levels; stenotaphrum secundatum; plant nutrients; growth media; plant growth; soil nutrients
Summary: Warm-season turfgrasses are often grown under intensively managed conditions and as a result special attention must be paid to the management of their nutrition. This project will attempt to develop management practices which will sustain the nutritional needs of the turfgrasses while minimizing the environmental impact of these practices.
Progress: Environmental fate of applied nutrients in turfgrass management was studied in environmentally controlled glasshouse studies. A N balance was calculated by summing turfgrass uptake, soil retention and leaching losses for various soluble and slow-release N sources. Under simulated natural rainfall conditions Tifsport bermudagrass accumulated between 49.8 and 62.4% of the N applied depending on N source depending on the N source applied. Application of soluble N sources such as ammonium nitrate and ammonium sulfate resulted in lower total N accumulation and the slow-release N sources, methylene ureas, sulfur coated and polymer coated ureas, resulted the higher accumulation percentages. Relatively small quantities of N were leached regardless of the N source. Application of soluble and slow-release N sources resulted in 10 and 4% of the applied N leached, respectively.

Methodologies for determining the N release of various slow-release N materials were also investigated. These studies were conducted over a period of 182 days using column lysimetery in glasshouse/laboratory environments. Periodically programmed leachates were collected and analyzed for N and the cummulative N released over time was plotted. Regression techniques were used in conjunction with progressive extraction data to determine how well the actual N release from a given slow-release N source could be predicted. For polymer coated urea the acutual N release was predicted within a 90% probability.
Impacts: These studies could result in modifications in turfgrass fertility management that would eliminate N leaching losses and enhance turfgrass quality. Additionally, establishment of extraction methodologies for determining N release rates for slow-release N sources could result in verification of slow-release N claims.
Source of Federal Funds: Hatch
Scope: Integrated

Project Number: FLA-SWS-03820
Title: ***PEDOLOGICAL RESEARCH IN FLORIDA***
Critical Needs:
National Goals: 4
Key Themes: soil classification; soil genesis; soil surveys; remote sensing; geology; soil properties; spatial distribution; vegetation; hydrology; stratigraphy; landscapes; internet; field studies; laboratory tests; soil taxonomy; physical properties; chemical properties; soil mineralogy; urban areas; waste disposal; information dissemination
Summary: Soil is a basic, nonrenewable resource of utmost importance in the world. This natural resource is particularly important in Florida because of the competition between agricultural and urban uses for soil. Therefore, it is important to conduct field and laboratory investigations that allows for us to interpret the associations among soil patterns, distributions, properties, and behavior of soils as a function of vegetation, hydrology, stratigraphy, and landscape position for basic and applied inquiries.
Progress: There are two main research project both involving the study of subaqueous soils. 1) Methodology to Determine the Attributes of Subaqueous Soils as Related to Existing and Potential Submerged Aquatic Vegetation. The objectives are: Map submerged aquatic vegetation (SAV): The 2001 aerial photography provides an excellent base map at the 1:24,000 scale. Based on photo tone and ground truthing, polygons are being digitized. These polygons will be populated with ground cover attributes such as SAV species, percent cover, etc. Quantify soil attributes throughout various tides/seasons: Some soil properties are expected to change with seasons such as pH, temperature, total P and possibly with tidal fluctuations while other properties are expected to remain constant such as particle size and percent OM. Develop several classes of subaqueous soils that reflect soil properties that are the least temporal: Classes based on temporally unstable properties are useless. After determining which soil properties are temporally stable, we will focus on interpreting the range and variability of those properties so that useful classes of soil can be created. Develop a methodology for mapping subaqueous soils: Together, the maps and descriptions of map units along with interpretations of those map units with respect to land use will comprise the soil survey. The tasks will be summarized into a guide for mapping subaqueous soils. Already we have determined a preferred method of sampling deep soils for the purpose of describing soils. We are refining our sampling method for retrieving soils to be sent to the lab for physical and chemical analysis. 2) Biogeochemical Characteristics of Subaqueous Soils as Related to Aquatic Vegetation in Three Gulf Coast Rivers. The research is designed to cross the terrestrial-aquatic interface in order to confirm established hypotheses and to better understand the biogeochemical cycling within the river systems. Overall, the purpose of this proposed research is to complement the recently renewed vegetative study by quantifying the subaqueous soils and their biogeochemical role in the Homosassa, Weeki Wachee, and Chassahowitzka Rivers. A need for information crossing the terrestrial-aquatic interface has required the development of innovative sampling methodologies designed in order to understand the inherent complexities of surface-subsurface interactions. As a result of this investigation, information will be acquired as to: 1) the physical, chemical, and biological properties of subaqueous

soils in these rivers, and 2) the association between soil physical, chemical, and biological properties and the abundance and distribution of submerged aquatic vegetation in the Homosassa, Weeki Wachee, and Chassahowitzka Rivers, and 3) the role of hydrology in connecting the surface and subsurface environments and the ecological significance and consequences of their interaction.
Impacts: Submerged Aquatic Vegetation (SAV) is among the most productive ecosystems in the world. In saline areas SAV includes both true seagrasses and freshwater angiosperms in lower salinity zones of estuaries. They perform irreplaceable ecological functions that include food and shelter for commercial, recreational and ecologically important organisms, chemical cycling, and physical modifications of the water column and sediments. Due to their ecological and commercial importance, SAV communities are provided significant legal protection and impacts to these communities are highly regulated. Understanding the environmental conditions that influence SAV establishment, survival and proliferation are paramount to success. Substantial efforts in recent years have focused on the affects of water quality on SAV establishment and light attenuation on depth distribution. Another environmental variable may be substrate characteristics due to the fact SAV species are rooted. In 1999 the USDA-Natural Resources Conservation Service changed the definition of soil. Now sediments that are below 2.5m or less of water and have pedological features are called subaqueous soils. Therefore, near-coast marine sediments are now subaqueous soils, and their properties could have an impact on the type and distribution of SAV. Thus, an opportunity exists where newly defined soils within the coastal environment may provide a significant resource similar to our understanding of SAV dynamics as well as attributes and functionality of other near shore marine habitat.
Source of Federal Funds: Hatch
Scope: State

Project Number: FLA-WEC-03618
Title: ***SAVANNA ECOLOGY AND MANAGEMENT: ROLE OF FIRE, GRAZING, AND EXOTIC SPECIES***
Critical Needs:
National Goals: 4
Key Themes: ecology; plant ecology; savannas; plant communities; prairies; rangelands; ecosystem management; land management; fire effects; grazing; field studies; simulation models; exotic plants; herbivores
Summary: The responses of Florida savanna plants to fire, grazing, and introduced species is poorly understood. This project examines long-term responses of tree and grass populations under experimental treatments of fire and grazing in order to improve management recommendations.
Progress: Grazing and herbicide treatments were installed and monitorwas begun for the control of paragrass at the Goodwin Wildlife Management Area, Florida. Box turtles were captured, marked, and a subset fitted with radio transmitters on the Joseph Jones Ecological Research Center, Georgia. Initial tracking began and plans for prescribed fire within their terretories were developed. Study sites within oak scrub and adjacent mesic habitats on the Cedar Key State Park were selected to investigate vertebrate responses to fire. Specifically, it is unknown if scrub dwellers use nearby refugia following fire.
Impacts: Methods of managing the invasive, exotic paragrass will provide waterfowl habitat managers means of improving the quality of impoundments. Knowledge of box turtle movements in relation of fire will improve fire prescriptions to reduce negative impacts to this species. Use of fire refugia will improve overall fire management in the scrub ecosystem.
Source of Federal Funds: Hatch
Scope: State

VI. EXTENSION IMPACT STATEMENTS

Planned Program area reports (based on Florida State Goals)

Planned Program 1: To enhance and maintain agricultural and food systems

Long Term

National Goals: 1, 4

KEY THEMES: Adding Value to New and Old Agricultural Products, Agricultural Competitiveness, Agricultural Profitability, Animal Genomics, Animal Health, Animal Production Efficiency, Apiculture, Aquaculture, Biobased Products, Biofuels, Biotechnology, Bioterrorism, Diversified/Alternative Agriculture, Emerging Infectious Diseases, GIS/GPS, Grazing, Home Lawn and Gardening, Innovative Farming Techniques, Invasive Species, Managing Change in Agriculture, New Uses for Agricultural Products, Niche Market, Organic Agriculture, Ornamental/Green Agriculture, Plant Genomics, Plant Germplasm, Plant Health, Plant Production Efficiency, Precision Agriculture, Rangeland/Pasture Management, Risk Management, Small Farm Viability, Tropical Agriculture, Urban Gardening, Agricultural Waste Management, Air Quality, Biodiversity, Biological Control, Drought Prevention and Mitigation, Endangered Species, Energy Conservation, Forest Crops, Forest Resource Management, Global Change and Climate Change, Hazardous Materials, Integrated Pest Management, Land Use, Natural Resources Management, Nutrient Management, Permaculture Land Management, Pesticide Application, Recycling, Riparian Management, Soil Erosion, Soil Quality, Sustainable Agriculture, Water Quality, Weather and Climate, Wetlands Restoration and Protection, Wildfire Science and Management, Wildlife Management, Yard Waste/Composting

Statement of Issue

The scope of challenges and opportunities facing agriculture and natural resource industries of Florida fall into four primary areas: 1) economic well-being, 2) environmental issues, 3) quality, safety and security issues, and 4) civic engagement.

Economic Well-Being:

5. Declining profitability due to stable or falling commodity prices and increasing cost of production.
6. Liberalized trade agreements that reduce tariffs and subsidies can benefit both foreign and domestic producers by having greater access to markets.
7. Resource limitations resulting from
    1. Land loss due to urban sprawl,
    2. Increased water consumption due to population growth,
    3. Restricted use of farm inputs due to environmental concerns, and
    4. Reduced availability of labor due to a growing reliance on migrant labor.
8. New and innovative products and processing technologies must be developed for the industry to remain competitive and to adequately meet the rising expectations of consumers.

Environmental issues:

Public concern over the following environmental issues has translated into increasingly stringent and costly environmental regulations on certain agricultural practices that can adversely affect a firm’s economic viability in the short run and sustainability in the longer run.

4. Water quality, as impacted by agricultural production practices, such as fertilizer and pesticide residue leaching and runoff, and management of waste from livestock and aquaculture production,
5. Water availability as impacted by production-related surface and groundwater withdrawals,
6. Conservation of the state's natural resource base, including land for production, wildlife habitat, green space, and fresh and saltwater recreation.

Quality, Safety and Security Issues:

8. A heightened awareness by agricultural producers and processors concerning safe production practices such as chemical residues, biological safety concerns, and personal hygiene practices.
9. Continued development of modern processing, distribution and storage, technologies and the use of improved handling practices that prevent unnecessary food losses while simultaneously ensuring high quality and safety standards;
10. Availability of a wide range of wholesome foods that meet the needs of an increasingly unhealthy population;
11. At the retail sector, adequate packaging and labeling so that consumers have reliable information to optimize their food choices;
12. Development and implementation of food safety and security programs that protect the nation's food supply, and;
13. Providing adequate information to the state and country's farm laborers who support agriculture to help them avoid dangers from equipment and exposure to farm chemicals that pose a number of potential risks to their health and safety.

Civic Engagement:

Awareness of agriculture and natural resources and their contribution to the state's economic, environmental, and social well-being. Agricultural awareness efforts can create an informed voting public so that wise choices can be made that benefit Florida's citizens and visitors. The scope of these issues includes:

6. Educating the public regarding the role and importance of agriculture in Florida's economy, the stewardship of natural resources, and the relationship between agricultural production and food availability.
7. Keeping legislators up-to-date on industry concerns, such as pesticide regulations, worker protection standards, immigration, and international trade.
8. Providing public interest groups and the media with objective information regarding the contributions of the agricultural industry,
9. Developing information and programs that educate the industry regarding new information on such topics as Best Management Practices, regulatory legislation, and technological advancements.
10. Assisting the industry to promote the numerous benefits of agriculture.

Planned Program 1 is divided into 4 focus areas:

1. Agricultural profitability and the sustainable use of environmental resources
2. Awareness of Agriculture's Importance to an Economy that ranges from local to global
3. Plant, animal and human protection
4. Processing, distribution, safety and security of food systems

Focus area 1: **Agricultural Profitability and the Sustainable Use of Environmental Resources**

Summary of Topics Addressed

Topic	# Programs Conducted
Business Management	129
Climate/Weather	97
Environmental Stewardship	150
Harvesting/Processing	136
Marketing	105
Pest Management/Crop Protection	146
Policy/Trade	33
Production Management Practices	178

Regulations/Regulatory	109
Water Use Decisions	
Value Added Processes	46

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
4,298	1,235	7,356	21,980	32,148	327,87	624,001	119,059	268,857	626,587	1,014,503

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	47	47	1,686	2,603	19,147	275	7,091	16,645	222	23,958
Email	20	20	785	1,034	47,527	11,687	14,174	39,250	7,834	61,258
Office Visit	49	49	785	747	8,707	147	3,080	7,419	107	10,606
Radio/TV	748	748	18,19	2,121	179,521	2,328,533	102,925	98,697	2,328,350	2,529,972
Telephone	125	125	2,029	1,971	33,305	433,204	11,590	29,434	429,914	470,938
Web Site	7	7	116	14	2,229	244,530	801	1,609	244,488	246,898
Total all Contacts	996	996	23,60	8,490	290,436	3,018,376	139,661	193,054	3,010,915	3,343,630

Summary of Programs for Target Audiences

Target Audience	# Programs Conducted
Extension Faculty	153
General Public	14
Government Agencies	127
Harvesting/Packing/Processing/Distributio	78
Producers	242
Youth	54

Summary of Programs for Primary audiences

Target Audience	# Programs Conducted
4H (K-12)	37
Allied Industry Representatives	133
Bee Keepers	7
Commodity Associations	118
County Extension Faculty	144
County Government	91
Distributors/Transporters	30
Dooryard citrus growers	2
Dooryard landscapers	6
Federal Government	64
Government Agencies	101
Harvesters/Packers	57
Importers/Exporters	30
International Governing Bodies	13
Managers/Supervisors	187
Master Gardeners	13
Owners/Operators	231
Processors	36
Research Faculty	85
Retailers	36
Small Farms	199
State Extension Faculty	106
Tribal Government	10
Workers/Laborers	130
Youth Educators	43

Outcomes Accomplished by Focus Area 1

Type of Outcome: Attitude Change

Outcome	Evaluate	Making Change
Economic Efficiency	2,484	1,648

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Advanced certification and/or license	267	243
Communication and interaction with stakeholders	4,650	2,850
Economic Efficiency	3,120	3,072
Record keeping and financial planning systems	0	30
Safe handling of fuel, fertilizers and pesticides	136	136
Sustainable rotation systems	0	20

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Agro-terrorism prevention practices	40	24
Appropriate fertility programs	2,235	1,701
Appropriate varieties/breeds/cultivars/rootstock	8,286	6,885
Compliance with laws and regulations	33	24
Economic Efficiency	36,464	31,332
Efficient irrigation systems and technologies	477	450
Improve Animal Sciences Skills	16,024	14,280
Increased public awareness of environmental stewardship practices by agricultural and natural resource entities	140	120
Integrated pest management strategies	4,644	4,506
Pest control strategies	8,010	5,682
Precision agriculture practices	1,536	1,088
Processing systems for agricultural products	36	54
Reduced contamination of natural resource systems	20	20
Safe handling of fuel, fertilizers and pesticides	692	400
Value added product development	0	24
Waste management practices	60	60
Water management	279	249

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Advanced certification and/or license	16,464	16,074
Agro-terrorism prevention practices	200	120
Alternative enterprises	13,281	8,469
Appropriate fertility programs	6,108	6,018
Appropriate varieties/breeds/cultivars/rootstock	40,701	37,476
Communication and interaction with stakeholders	1,500	1,269
Compliance with laws and regulations	3,369	1,314
Efficient irrigation systems and technologies	10,356	6,087
Enterprise budgets and analysis	3,792	1,164
Greater Understanding of domestic and international competition, markets and policies	137	137
Improve Animal Sciences Skills	15,900	15,060
Increased public awareness of environmental stewardship practices by agricultural and natural resource entities	9,104	8,598
Integrated pest management strategies	8,952	6,033

Marketing practices for agricultural products	6,077	5,733
Pest control strategies	119,052	48,120
Precision agriculture practices	0	0
Record keeping and financial planning systems	4,320	1,380
Reduced contamination of natural resource systems	1,980	100
Safe handling of fuel, fertilizers and pesticides	28,360	25,280
Sustainable rotation systems	3,456	1,200
Value added product development	1,176	1,160
Waste management practices	414	414
Water management	243	183
Wildlife habitat availability	105	105

Type of Outcome: Skills Developed

Outcome	Evaluate	Making Change
Advanced certification and/or license	879	456
Enterprise budgets and analysis	40	40
Improve Animal Sciences Skills	752	616
Record keeping and financial planning systems	130	95

Type of Outcome: Technology Adopted

Outcome	Evaluate	Making Change
Alternative enterprises	666	555
Appropriate fertility programs	33	24
Efficient irrigation systems and technologies	45	42
Integrated pest management strategies	201	186
Pest control strategies	75	63
Processing systems for agricultural products	0	0
Record keeping and financial planning systems	480	480

Focus Area 2: Awareness of Agriculture's Importance to an Economy That Ranges From Local to Global

Summary of Topics Addressed

Topic	# Programs Conducted
Consumer Education And Public Relations	26
Environmental Issues	16
Role Of Agriculture In Local And Regional	19

Summary of Subjects Taught

Subject	# Programs Conducted

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
170	90	353	2,407	3,809	23,837	79,039	14,603	16,244	78,688	109,535

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	17	2	282	26	77	224	26	327
Email	0	0	58	1	696	100	213	557	100	870
Office Visit	1	1	34	4	238	22	103	175	22	300

Radio/TV	0	0	0	0	0	102,000	0	0	102,000	102,000
Telephone	0	0	135	217	1,075	340	365	1,080	340	1,785
Web Site	0	0	2	0	75	0	37	41	0	78
Total all Contacts	1	1	246	224	2,366	102,488	795	2,077	102,488	105,360

Summary of Programs for Target Audiences

	# Programs
Extension Faculty	13
General Public	19
Government Agencies	20
Harvesting/Packing/Processing/Distributio	5
Producers	18
Youth	15

Summary of Programs for Primary Audiences

	# Programs
4H (K-12)	11
Allied Industry Representatives	5
Commodity Associations	9
Consumers	19
County Extension Faculty	13
County Government	17
Distributors/Transporters	2
Federal Government	6
Government Agencies	15
Harvesters/Packers	4
International Governing Bodies	4
Managers/Supervisors	8
Owners/Operators	16
Processors	1
Research Faculty	7
Retailers	2
Small Farms	13
State Extension Faculty	9
Tribal Government	1
Workers/Laborers	5
Youth Educators	12

Outcomes

Type of Outcome: Attitude Change

Outcome	Evaluate	Making Change
Greater political support for agriculture and natural resources	1,120	840
Increased awareness of economic impacts of agriculture and natural resources	972	954
Increased communication and interaction with stakeholders	2,688	1,904
Increased public awareness of environmental stewardship practices by agricultural and natural resource entities	0	0

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Appreciation for the goods and services from agriculture and natural resoureces	3,976	3,968
Improve Agriculture and Environmental Knowledge/Skills	1,562	1,532
Increased awareness of economic impacts of agriculture and natural resources	2,482	1,862
Increased communication and interaction with stakeholders	0	0
Increased consumer confidence in Florida's agricultural products	0	0
Increased public awareness of environmental stewardship practices by agricultural and natural resource entities	400	400

Focus Area 3: Plant, Animal and Human Protection

Summary of Topics Addressed

	# Programs

Agrosecurity	10
Diagnostics	32
Exotics and Invasives	23
Integrated Pest Management (IPM)	42
Pesticide Safety Education (PSE)	42

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
1,242	31	1,079	4,638	22,912	48,103	103,687	23,201	57,905	99,344	180,450

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	56	107	897	3,261	229	847	3,261	4,337
Email	0	0	271	236	1,743	11,353	1,363	2,208	10,067	13,638
Office Visit	0	0	148	320	1,663	805	622	2,202	138	2,962
Radio/TV	25	25	105	63	2,268	12	1,245	1,255	5	2,505
Telephone	1	1	430	1,072	3,686	448,162	2,445	5,453	445,602	453,500
Web Site	2	2	5	2	380	150,215	189	201	150,215	150,605
Total all Contacts	28	28	1,015	1,800	10,637	613,808	6,093	12,166	609,288	627,547

Summary of Programs for Target Audiences

Target Audience	# Programs Conducted
Extension Faculty	21
General Public	20
Government Agencies	20
Harvesting/Packing/Processing/Distributio	11
Producers	48
Professional Horticulture Services/Urban	32
Youth	2

Summary of Programs for Primary Audiences

Target Audience	# Programs Conducted
4H (K-12)	1
Allied Industry Representatives	21
Builders and Developers	3
Business Owners and Managers	13
Coastal Residents	10
Commodity Associations	14
Consumers	20
County Extension Directors	7
County Extension Faculty	21
County Government	13
Distributors/Transporters	5
District Extension Directors	6
Elected Officials -- County	1
Elected Officials -- Municipal	2
Elected Officials -- State	2
Federal Government	8
Government Agencies	14
Harvesters/Packers	6
Importers/Exporters	3
Lakeshore residents	8
Managers/Supervisors	38
Owners/Operators	43
Pesticide Applicators	25
Policymakers	6
Print media	5
Processors	4

Professional Horticulture Services	16
Property Managers	15
Radio	4
Recreational Turf Managers	15
Retail and Allied Services	6
Retailers	2
Seasonal residents and tourists	10
Small Farms	35
State Extension Faculty	14
Television	2
Tree Care Providers	9
Tribal Government	1
Workers/Laborers	32
Youth Educators	2

Outcomes

Type of Outcome: Attitude Change

Outcome	Evaluate	Making Change
Read and interpret modern pesticide label statements	111	105

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Adoption of appropriate pest management tools	450	440
Improved diagnostic/identification skills/services, landscape maintenance services, and pesticide usage.	476	336
Increased adoption of pesticide safety	5,256	3,816
Integrated pest management strategies	1,950	1,770
Pesticide application practices	57	57
Safe handling of fuel, fertilizers and pesticides	111	105
Timely response to pest outbreaks	200	160

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Able to correctly follow pesticide labels.	3,218	2,624
Adoption of appropriate pest management tools	0	0
Advanced certification and/or license	0	0
Aware of pesticide appropriate behaviors, actions, procedures or PPE.	4,032	3,556
Crop Producers aware of training resources for chemical safety.	0	0
Demonstrate satisfactory competence in pesticide knowledge and skills.	240	93
Determine appropriate pesticides and application timing.	240	117
Increased usage of diagnostic services	0	0
Livestock Producers aware of training resources for chemical safety.	0	0
Pass certification exam	3,600	3,600
Pesticide application practices	240	90
Small Farm Owners understand appropriate safety measures for safe chemical handling.	198	198

Type of Outcome: Hours Contributed

Outcome	Evaluate	Making Change

Advanced certification and/or license	208	208

Type of Outcome: Knowledge Gain		**Making**
Outcome	**Evaluate**	**Change**
Able to correctly follow pesticide labels.	6,654	6,418
Adoption of appropriate pest management tools	185	175
Advanced certification and/or license	25,056	20,104
Agencies responsible for regulating pesticide application in Florida	0	0
Agro-terrorism prevention practices	5,316	4,692
Aware of pesticide appropriate behaviors, actions, procedures or PPE.	6,516	6,236
Crop Producers aware of training resources for chemical safety.	0	0
Crop Producers understand appropriate safety measures for safe chemical handling.	1,148	1,148
Demonstrate satisfactory competence in pesticide knowledge and skills.	240	210
Describe the factors that influence whether pesticides will move offsite in either water or air.	165	160
Determine appropriate pesticides and application timing.	48	45
Florida pesticide laws and regulations	501	435
Home Owners understand appropriate safety measures for safe chemical handling.	180	0
Identify common insect pests of ornamentals.	38	38
Increased adoption of pesticide safety	13,356	13,344
Increased knowledge of sampling and monitoring procedures and pest thresholds	68	58
Increased usage of diagnostic services	138	114
Integrated pest management strategies	2,568	2,277
Knowledge of pesticide handling practices, procedures, equipment, or facilities.	2,816	2,816
Knowledge of product specific pesticide characteristics.	16	16
Knowledge/awareness of Florida's pesticide laws.	0	0
Pass certification exam	80	80
Pesticide application practices	321	270
Principles of modern pest control	567	564
Worker Protection Standards (WPS)	41,709	40,539

Type of Outcome: Percent		**Making**
Outcome	**Evaluate**	**Change**
Pass certification exam	380	220

Type of Outcome: Skills Developed		**Making**
Outcome	**Evaluate**	**Change**
Advanced certification and/or license	3,916	3,552
Demonstrate satisfactory competence in pesticide knowledge and skills.	429	420
Improved diagnostic/identification skills/services, landscape maintenance services, and pesticide usage.	380	380

Type of Outcome: Technology Adopted		**Making**
Outcome	**Evaluate**	**Change**
Increased adoption of pesticide safety	690	348

Focus Area 4: Processing, Distribution, Safety and Security of Food Systems

Summary of Topics Addressed

Topic	# Programs Conducted
Food Quality and Technology	11
Food Safety and Handling	20
Food Security	9
Regulations/Regulatory	6
Transportation and Distribution	6

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
223	9	265	768	894	6,599	3,370	2,243	6,383	3,279	11,905

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	51	24	89	0	21	145	0	166
Email	0	0	10	1	51	21	15	68	0	83
Office Visit	0	0	16	8	44	0	12	56	0	68
Radio/TV	0	0	6	2	47	20	9	41	25	75
Telephone	0	0	55	45	241	17	110	250	20	380
Total all Contacts	0	0	138	80	472	58	167	560	45	772

Summary of Programs for Target Audiences

Target Audience	# Programs Conducted
Extension Faculty	11
General Public	2
Government Agencies	8
Harvesting/Packing/Processing/Distributio	14
Producers	16
Youth	1

Summary of Programs for Primary Audiences

Target Audience	# Programs Conducted
4H (K-12)	1
Allied Industry Representatives	7
Commodity Associations	7
Consumers	2
County Extension Faculty	7
County Government	2
Distributors/Transporters	12
Federal Government	6
Government Agencies	8
Harvesters/Packers	10
Importers/Exporters	7
International Governing Bodies	4
Managers/Supervisors	10
Owners/Operators	11
Print media	1
Processors	11
Producers (Citrus)	3
Producers (Crops)	8
Producers (Livestock)	1
Producers (Ornamentals)	3
Research Faculty	7
Retailers	7
Small Farms	5
State Extension Faculty	8
Workers/Laborers	6

Outcomes

Type of Outcome: Attitude Change Outcome	Evaluate	Making Change
Improved food handling practices	0	0
Improved food safety and security	0	0

Type of Outcome: Behavior Change Made Outcome	Evaluate	Making Change
Improved food processing	312	312

Type of Outcome: Best Practices Followed Outcome	Evaluate	Making Change
Improved food handling practices	1,140	1,140
Improved food safety and security	80	80

Type of Outcome: Knowledge Gain Outcome	Evaluate	Making Change
Improved food handling practices	1,040	1,040
Improved food processing	750	720
Improved understanding of import/export regulations	0	0
Understanding of food regulations (domestic and/or international)	48	48

Type of Outcome: Number planning to adopt best practice Outcome	Evaluate	Making Change
Improved safety and security at the retail level	250	240

Type of Outcome: Skills Developed Outcome	Evaluate	Making Change
Improved safety and security at the retail level	430	365

Success Stories for Planned Program 1

Source of funds: Smith-Lever
Scope: integrated, multistate, state

States involved: To enhance and maintain agricultural and food systems
AL, AR, AZ, CA, CO, DC, DE, FL, GA, HI, IA, IL, IN, KS, KY, LA, MD, ME, MN, MO, MS, MT, NC, NE, NJ, NM, NY, OH, OK, OR, PR, SC, SD, TN, TX, VA, VI, VT, WI

Planned Program 2: To maintain and enhance Florida's Environment

Long Term
National Goals 1,4

KEY THEMES: Agricultural Waste Management, Air Quality, Biodiversity, Biological Control, Drought Prevention and Mitigation, Endangered Species, Energy Conservation, Forest Crops, Forest Resource Management, Global Change and Climate Change, Hazardous Materials, Integrated Pest Management, Land

Use, Natural Resources Management, Nutrient Management, Permaculture Land Management, Pesticide Application, Recycling, Riparian Management, Soil Erosion, Soil Quality, Sustainable Agriculture, Water Quality, Weather and Climate, Wetlands Restoration and Protection, Wildfire Science and Management, Wildlife Management, Yard Waste/Composting, Aquaculture, Biobased Products, Biofuels, Biotechnology, Bioterrorism, Diversified/Alternative Agriculture, Emerging Infectious Diseases, GIS/GPS, Home Lawn and Gardening, Invasive Species, Organic Agriculture, Ornamental/Green Agriculture, Plant Genomics, Plant Germplasm, Plant Health, Precision Agriculture, Rangeland/Pasture Management, Risk Management, Small Farm Viability, Tropical Agriculture, Urban Gardening

Statement of Issue

Florida depends heavily on a healthy and sustainable environment. For example, freshwater is a critical resource for agriculture, industry, natural systems, tourism, and the health and convenience of all Floridians. From another view, Florida is a saltwater state. Its estuarine, coastal and marine systems stretch further than all the other Atlantic states from Georgia to New England, and they produce over $5 billion in fisheries and wildlife resources each year, buffer coastal areas from storms, absorb pollutants and provide amenities for coastal settlement, trade and tourism, including over 1 million boaters and divers per year. Terrestrial and freshwater flora and fauna also contribute significantly to Florida's economy and the quality of life enjoyed by residents and tourists. People recognize the value of their environment. For example, prevention of water pollution, protecting the marine environment, and conservation of wildlife habitat and endangered species were rated as high priority educational issues by 72%, 64% and 50% of respondents to a 1999 survey. As shown by this survey, there is an opportunity and need to inform and educate Floridians about their environment.

The sustainability and health of Florida's environment is under pressure from a range of human activities. For example, Florida's water supply is currently sufficient, but experts predict that the 700 new residents arriving in Florida each day will increase demand to 9.3 billion gallons per day by 2020. This increase will put severe pressure on the state's water and other natural resources. The number of people living in Florida also increases potentially damaging inputs that enter coastal waters via watersheds and runoff. For example, household pesticide use is one factor that leads to five of Florida's estuaries being among the ten U.S. estuaries most threatened by pesticides. Historical losses of 50% of the salt marsh, 60% of the seagrass, and 85% of the mangroves in some of Florida's estuaries also need to be repaired. In addition, Florida ranks third among states in the number of plants and animals federally listed as being in danger of becoming extinct, and half of all Florida's non-marine vertebrates are declining in number. Successful management of these threats will require raised awareness, widespread distribution of useful information, suitable skills, and the demonstration of alternative behaviors that can ensure the quality and quantity of Florida's natural resources.

The overall objective of this Goal is to sustain or enhance Florida's environment by increasing relevant knowledge and by motivating citizens, professionals, and agency personnel to take actions that reduce impacts on these valuable resources. The primary impact of this work will be increased efforts to apply sustainable management in Florida. This impact hinges on promoting increased awareness and understanding of ecological, economic, social and management principles and processes among citizens, professionals, and agency personnel. Tangible results include an increased involvement of citizens in monitoring and management, an increased use of key ecological concepts in discussions held by state and federal management agencies, and an increased awareness and use of adaptive and participative management. Programs that improve the skills and resources available to environmental educators also represent critical elements in achieving these objectives.

Planned Program 2 is divided into 4 focus areas

1. Conservation and sustainable use of coastal and marine natural resources and ecosystems
2. Conservation and sustainable use of freshwater and terrestrial natural resources and ecosystems.
3. Environmental education

4. Water resources

Focus Area 1: Conservation and sustainable use of coastal and marine natural resources and ecosystems

Summary of Topics Addressed

Topic	# Programs Conducted
Environmental Stewardship	6
Environmentally and economically friendly	46
Marketing UF/IFAS Extension and Florida	3
Promoting and supporting volunteer	26
Understanding estuarine, coastal and	39
Understanding and improving human inter	30
Watershed education	23

Summary of Subjects Taught

Subject	# Programs Conducted

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
700	58	472	3,962	4,678	39,982	270,264	20,145	29,770	269,501	319,416

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	1	1	37	45	973	696	353	709	694	1,756
Email	1	1	138	614	1,269	7,365	914	1,213	7,270	9,397
Office Visit	6	6	35	69	1,333	57	864	622	53	1,539
Radio/TV	231	231	12,19	1,039	47,115	1,758,450	31,200	28,800	1,759,150	1,819,150
Telephone	30	30	222	356	3,857	2,743	2,533	2,562	2,171	7,266
Web Site	0	0	0	0	0	102,534	39	24	102,471	102,534
Total all Contacts	269	269	12,62	2,123	54,547	1,871,845	35,903	33,930	1,871,809	1,941,642

Summary of Programs for Target Audiences

Target Audience	# Programs Conducted
Advisory Committee	9
Biotechnology sector	1
Boating sector	33
Commercial fishing sector	19
Educators	27
Extension Faculty	10
Government Agencies	4
Land owners, users and developers	30
Natural resource managers	33
Other marine related sectors	26
Policy Makers and Community Leaders	26
Recreational fishing sector	28
Youth	19

Summary of Programs for Primary Audiences

Target Audience	# Programs Conducted
4H participants	13
4H Volunteers	11
Adult participants in fishing tournaments	10
Aquarists	4
Bait and tackle retailers	11
Biotechnology firms	1
Biotechnology researchers	1
Boat and boat supply retailers	6
Boating groups	18
Boatyard operators	10
Charter boat operators	15
Coastal Residents	25
College faculty and other researchers	13
College students	10
Commercial fishers	19
Consultants -- Environmental	11
County Extension Directors	2
County Extension Faculty	8

County Government	4
County Government -- County managers	28
County Government -- County planners	16
Developers	8
District Extension Directors	3
Dive clubs	11
Dive shop operators	11
Divers	17
Eco-tourism providers	14
Elected Officials -- County	15
Elected Officials -- Municipal	5
Elected Officials -- State	5
Elected Officials -- U.S.	4
Extension Advisory Committees	9
Extension State Program Leaders	6
Fishing clubs	17
Fishing tournament organizers	9
Fishing guides	10
Florida Bar Association	1
Government Agencies	4
Homeowners associations	12
International managers	3
Interpreters	10
Landscape designers,	8
Marina Owners and Operators	17
Marine attractions operators	12
Marine attractions visitors	5
Multi-state regional managers	11
Municipal planners and managers	17
Navigational districts	9
Other non-formal educators	24
Place-based management partnerships	5
Port authorities	3
Private land managers	9
Producers	4
Public aquaria operators	4
Public aquaria visitors	2
Recreational boaters	26
Recreational fishers	25
Rural ranchette owners	3
Rural, suburban and urban renters	3
Rural, suburban and urban single family	7
School Teachers -- Grades 6-8	14
School Teachers -- Grades 9-12	14
School Teachers -- Grades K-5	11
Seafood processors	4
Seafood consumers	3
State Extension Faculty	4
State Government -- planners and managers	29
Suburban and urban multi-family owners	4
Surf shop operators	1

Surfers	3
Youth Educators	2
Youth participants in fishing tournaments	7
Youth all ages (K-12)	16

Outcomes Accomplished by Focus Area

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Increased public awareness of environmental stewardship practices by agricultural and natural resource entities	0	0
Number of contact hours per participant in educational or training sessions	82	82
Number of contact hours per volunteer	194	194
Percentage increase in awareness or understanding - pre & post tests	554	476
Percentage of participants indicating an increase in awareness or understanding - survey	2,180	1,912

Type of Outcome: Skills Developed

Outcome	Evaluate	Making Change
Number of contact hours per participant in educational or training sessions	0	0
Percentage increase in awareness or understanding - pre & post tests	246	214
Percentage of participants indicating an increase in awareness or understanding - survey	264	150

Focus 2: Conservation and sustainable use of freshwater and terrestrial natural resources and ecosystems

Summary of Topics Addressed

Topic	# Programs Conducted
Environmental Stewardship	4
Environmentally and economically friendly	17
Promoting and supporting volunteer	7
Understanding and improving human	13
Understanding terrestrial and freshwater	17
Watershed education	4

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
339	28	150	772	231	12,435	10,620	4,893	9,683	9,660	24,236

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	20	6	397	0	101	323	0	424
Email	0	0	141	37	1,043	1,006	571	687	969	2,227
Office Visit	0	0	41	10	351	2	131	277	0	408
Radio/TV	0	0	0	0	0	5	0	0	5	5
Telephone	0	0	145	32	1,675	339	729	1,179	289	2,197
Web Site	0	0	0	0	0	29,528	0	0	29,528	29,528

Total all Contacts	0	0	347	85	3,466	30,880	1,532	2,466	30,791	34,789

Summary of Programs for Target Audiences Audiences

Target Audience	# Programs Conducted
Advisory Committee	2
Boating sector	2
Educators	12
Extension Faculty	12
Land owners, users and developers	22
Natural resource managers	19
Non-consumptive recreation sector	10
Policy Makers and Community Leaders	9
Recreational fishing sector	7
Recreational hunting sector	12
Youth	13

Summary of Programs for Primary

Target Audience	# Programs Conducted
4H participants	8
4H Volunteers	5
Adult participants in fishing tournaments	2
Bait and tackle retailers	1
Boating groups	2
Boatyard operators	1
College faculty and other researchers	6
College students	7
Consultants -- Environmental	14
County Extension Directors	3
County Extension Faculty	11
County Government -- County managers	13
County Government -- County planners	6
Developers	5
District Extension Directors	2
Dive clubs	1
Divers	2
Eco-tourism providers	1
Elected Officials -- County	6
Elected Officials -- Municipal	5
Elected Officials -- State	3
Elected Officials -- U.S.	5
Extension Advisory Committees	2
Extension State Program Leaders	3
Fishing clubs	2
Fishing tournament organizers	2
Fishing guides	1
Florida Bar Association	2
Hikers	6
Homeowners associations	9
Hunting clubs	8
Hunting guides	3
Hunting shop operators	1
International managers	3
Interpreters	5
Lakeshore residents	6
Land owners managing for hunting	11
Landscape designers,	9
Marina Owners and Operators	1
Multi-state regional managers	10
Municipal planners and managers	9
Nonformal educators	9
Place-based management partnerships	5
Private pond owners	9

Producers	13
Recreational boaters	2
Recreational fishers	6
Recreational hunters	8
Rural ranchette owners	12
Rural, suburban and urban renters	8
Rural, suburban and urban single family	15
School Teachers -- Grades 6-8	6
School Teachers -- Grades 9-12	6
School Teachers -- Grades K-5	4
State Extension Faculty	8
State Government -- planners and managers	16
Suburban and urban multi-family owners	7
Wildlife and birdwatching groups	10
Youth participants in fishing tournaments	1
Youth all ages (K-12)	11

Outcomes Accomplished by Focus Area

Type of Outcome: Attitude Change

Outcome	Evaluate	Making Change
Customer satisfaction with Extension Services	1,248	1,218
Percentage increase in awareness or understanding - pre & post tests	60	54
Percentage of participants indicating an increase in awareness or understanding - survey	33	30

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Percentage increase in awareness or understanding - pre & post tests	3,906	3,654
Percentage of participants indicating an increase in awareness or understanding - survey	3,276	2,790

Focus Area 3: Environmental education

Summary of Topics Addressed

Topic	# Programs Conducted
Engaging the audience	14
Home Building/Remodeling: Construction	11
Master Wildlife Conservation Program	10
Resource Management	5
Safety	4
Supporting community leaders	14
Supporting Education Reform in Florida	5

Summary of Subjects Taught

Subject	# Programs Conducted

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
275	5	229	29,504	3,190	118,470		85,033	66,374		151,407

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			

	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	360	456	3,234	54	2,219	1,903	0	4,122
Email	0	0	45	21	474	2,500	357	183	2,500	3,040
Office Visit	0	0	114	87	1,851	0	1,119	933	0	2,052
Radio/TV	30	30	2,480	2,300	41,040	0	28,500	17,500	0	46,000
Telephone	0	0	301	138	3,945	0	2,386	1,998	0	4,384
Web Site	0	0	75	2	656	0	403	330	0	733
Total all Contacts	30	30	3,375	3,004	51,200	2,554	34,984	22,847	2,500	60,331

Summary of Programs for Target Audiences

Target Audience	# Programs Conducted
Advisory Committee	3
Builders and Developers	9
Extension Faculty	7
Florida Residents	16
Providers of youth and adult based EE	19

Summary of Programs for Primary Audiences

Target Audience	# Programs Conducted
4H (K-12)	8
Adults	14
Builders -- Commercial	6
Builders -- Residential	8
County Extension Faculty	7
Extension Advisory Committees	3
Nonformal educators	9
Partnering agencies and organizations	12
Print media	8
Radio	7
School teachers	10
State Extension Faculty	1
Television	6
Youth all ages (K-12)	14

Outcomes Accomplished by Focus Area

Type of Outcome: Attitude Change

Outcome	Evaluate	Making Change
Participants will appreciate the complexity and intricacies of Florida's environment	5,140	4,640
Participants will enhance their community through environmental service projects	1,890	1,878
Partnering agencies and organizations will use Extension materials and programs	45	36

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Extension agents will use Best Practices for designing and delivering EE programs	0	0
Participants will be able and motivated to engage in community environmental issues	360	312
Teachers will use environmental education programs to meet SSS and help prepare youth for FCAT	75	60

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Participants will enhance their community through environmental service projects	0	0
Participants will use critical thinking skills in environmental problem solving	1,600	1,228

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change

Advanced certification and/or license	246	244
Extension volunteers will support environmental education programs	270	270
Participants will appreciate the complexity and intricacies of Florida's environment	6,884	5,548
Participants will have research-based information on environmental issues	0	0
Participants will understand multiple perspectives on environmental issues	120	90

Type of Outcome: Skills Developed

Outcome	Evaluate	Making Change
Participants will appreciate the complexity and intricacies of Florida's environment	900	900
Teachers will use environmental education programs to meet SSS and help prepare youth for FCAT	3,000	3,000

Focus Area 4: Water Resources

Summary of Topics Addressed

Topic	# Programs Conducted
Pollution prevention	7
Water quality	17
Water quantity	13
Watershed education	14

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
77	18	16	125	164	2,680	7	629	2,376	5	3,010

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	191	107	1,716	0	941	1,094	0	2,035
Email	0	0	21	22	482	81	196	329	85	610
Office Visit	0	0	5	5	114	23	53	72	23	148
Radio/TV	0	0	0	0	0	1,046,000	0	0	1,046,000	1,046,000
Telephone	0	0	57	12	961	7	213	820	6	1,039
Web Site	0	0	0	0	0	912	0	0	912	912
Total all Contacts	0	0	274	146	3,273	1,047,023	1,403	2,315	1,047,026	1,050,744

Summary of Programs for Target Audiences

Target Audience	# Programs Conducted
Educators	8
Extension Faculty	10
Extension Support Staff	6
Florida Permanent Residents	7
Florida Seasonal residents	2
Government Agencies	13
Industry	13
Natural resource managers	7
Non-Governmental Organizations	8

Summary of Programs for Primary Audiences

Target Audience	# Programs Conducted
Agricultural/horticultural support services	12
Coastal communities	3
Construction	1
Consultants	4
County Extension Directors	1
County Extension Faculty	11
County Extension Staff	5
District Extension Directors	1
Dooryard citrus growers	1

Producers	8
Recreation managers	3
Technical service providers	7

Extension State Program Leaders	2
Farm laborers	6
Farm Managers	3
Golf course and sports turf managers	2
Irrigation design/installation contractors	6
Landscape Design, Installation, and	7
Landscape designers,	3
Manufacturing	1
Multi-family housing owners/renters	4
Municipal Government	9
Organizations -- Environmental groups	8
Organizations -- Service	5
Paraprofessionals	2
Policymakers	6
Private land managers	6
Property Managers	4
Public land managers	7
Rural homeowners/renters	5
Rural ranchette owners	5
School teachers	5
Seasonal owners/renters	2
State Extension Faculty	5
Tourists	1
Urban single-family homeowners/renters	6
Waste generators and haulers	1
Water managers	12
Water-based (Marinas and charter boats)	1
Youth all ages (K-12)	2

Success Stories for Planned Program 2

Source of funds: Smith-Lever
Scope: integrated, multistate, state

States Involved: . To maintain and enhance Florida's environment
AL, AR, CA, DC, FL, GA, HI, IL, KY, LA, MS, NC, NM, OK, SC, TN, TX, VA, WA

Planned Program 3: To Develop Responsible and Productive Youth Through 4-H and Other Youth Programs

Long Term
National Goals: 5

KEY THEMES: Character/Ethics Education, Children Youth and Families at Risk, Communications Skills, Community Development, Conflict Management, Consumer Management, Estate Planning, Impact of Change on Rural Communities, Jobs/Employment, Leadership Training and Development, Literacy, Workforce Preparation – Youth and Adult, Youth Development/4-H, Youth Farm Safety

Statement of Issue

In an increasingly complex and competitive world market, the human capital of the United States is an important resource. Young people under 18 years represent 28.3% of the population in the United States and over 33% in Florida.

Each day America's youth decide how they will spend their waking hours when not in school. For many, these hours harbor both risk and opportunity. For some, particularly those supervised by adults, the out-of-school hours offer opportunities to be with friends, play sports, pursue interests, and engage in challenging activities. But for many home alone, the out-of-school hours present serious risks for substance abuse, crime, violence, and sexual activity. Time spent alone is not the crucial contributor to high risk. Rather it is what young people do during that time, where they do it, and with whom that leads to positive or negative consequences.

Positive youth development provides opportunities for youth to feel safe, secure, respected, intellectually stimulated, and engaged in their community. Positive youth development occurs from an intentional process that promotes positive outcomes for young people by providing opportunities, relationships, and support. Youth development takes place in families, peer groups, schools, neighborhoods and communities. 4-H Youth Development uses experiential, research-based educational opportunities that help youth become competent, caring, confident, connected, and contributing citizens of character.

Research indicates that regular participation in extracurricular activities during adolescence can lead to long-term payoffs. Recent studies indicate that youth spending time in positive youth programs, such as 4-H, are less likely to become involved in high risk behaviors, have higher school attendance and grades, better conflict management practices and better work habits. Additional research studies have shown that when young people have safe, structured, supervised and healthy activities in which to participate, they are less likely to become involved in the high-risk, unhealthy behaviors (such as substance abuse, crime, violence, and sexual activity) that can delay or derail positive development, and they are more likely to obtain a broad range of competencies. In addition, studies find that teens who are consistently involved in extracurricular activities are likely to go on to attend college, leading to increased lifetime earnings. Involved youth are also more likely as adults to vote in national and local elections, and to volunteer in community and religious organizations. This truly makes the concept of civic engagement real.

Recent surveys of 4-H members in Florida have shown that 4-H equips and trains the youth with leadership and communication skill, offers community service, and builds a network of people that the youth can later utilize.

Reports from 97% of Florida counties have prioritized three areas for youth programming: developing life skills and career awareness, creating constructive learning environments for youth (organizational design and development), and enhancing adult support system for youth (volunteer development).

The Florida 4-H program is committed to providing inclusive and positive youth development programs that target the following outcomes for young people:

- Youth are physically and emotionally safe;
- Youth develop and maintain positive relationships;
- Youth develop a sense of belonging, in an inclusive environment;
- Youth develop personal competencies for self-reliance, independence and autonomy;
- Youth grow and contribute as active citizens through service and leadership; and
- Youth develop marketable, productive skills and competencies for work and family life.

In summary, Florida IFAS/Extension 4-H will utilize positive youth development program standards identified through research and practice to enhance the knowledge, well-being, quality of life, and civic engagement of youth by focusing on:

- Life Skills Developed in Youth Through Subject Matter Experience
- Organizational Strategies and Learning Environments to Support Youth Programs, and
- Volunteer Development and Systems to Support Youth.

Planned Program 3 is divided into 3 focus areas:

1. Organizational Strategies and Learning Environments to Support Youth Programs
2. Volunteer Development and Systems to Support Youth
3. Life Skills Developed in Youth Through Subject Matter experiences

Focus Area 1: Organizational Strategies and Learning Environments to Support Youth Programs

Summary of Topics Addressed

Topic	# Programs Conducted
Marketing	68
Program Delivery Strategies	74
Resource Management	63

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
1,459	1,348	3,847	32,673	20,892	120,82	139,102	100,356	85,188	133,147	318,691

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	57	57	1,330	528	5,633	3,000	4,714	2,984	3,000	10,698
Email	24	24	873	236	8,462	2,836	6,980	3,062	2,448	12,490
Office Visit	15	15	634	168	7,686	52	6,013	2,648	0	8,661
Radio/TV	195	195	1,050	333	13,369	3,683,508	9,017	6,005	3,683,508	3,698,530
Telephone	58	58	1,723	595	13,968	6,141	12,325	4,659	5,593	22,577
Web Site	0	0	0	0	0	20,809	0	0	20,809	20,809
Total all Contacts	349	349	5,610	1,860	49,118	3,716,346	39,049	19,358	3,715,358	3,773,765

Summary of Programs for Target Audiences Audiences

Target Audience	# Programs Conducted
Advisory Committee	48
Extension Faculty	36
Extension Support Staff	30
Organizations	46
School Administrators	32
Volunteers	70
Youth	38

Summary of Programs for Primary

Target Audience	# Programs Conducted
4H EFNEP Volunteers	7
4H EFNEP Youth	1
4H Foundation	27
4H Volunteers	59
County Extension Directors	21
County Extension Faculty	34
County Extension Staff	24
District Extension Directors	18
Extension Advisory Committees	45
Organizations -- Civic	38
Organizations -- Leadership Groups	31
Organizations -- Non-Profit	38
Organizations -- Service	30
Program Assistants	26
Resource Volunteers	38
School Administrators	31
School board members	16

School Teachers -- Grades 6-8	32
School Teachers -- Grades 9-12	26
School Teachers -- Grades K-5	31
State Extension Faculty	18
Youth 11-13 (grades 6-8) years of age	33
Youth 14-18 (grades 9-12) years of age	36
Youth 5-7 (grades K-2) years of age	17
Youth 8-10 (grades 3-5) years of age	31
Youth At Risk	8
Youth Volunteers all ages	25
Youth all ages (K-12)	49

Outcomes Accomplished by Focus Area

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Community Clubs demonstate an inclusive environment	124	118
Engage in a positive, community based experiential, self governing groups	1,152	1,056
Local Citizens Determine Program Strengths, Weaknesses, and Opportunities	57	57
Participate in a variety of out-of-club experiences	1,656	1,656

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Improve Competencies to Deliver Youth Programs	120	120

Type of Outcome: Skills Developed

Outcome	Evaluate	Making Change
Improve Competencies to Deliver Youth Programs	94	94
Participants demonstrate skills in civic engagement and community service	4,300	4,300

Focus Area 2: Volunteer Development and Systems to Support Youth

Summary of Topics Addressed

Topic	# Programs Conducted
Agricultural Awareness and Literacy	5
Club Management	39
How to Guide Learning	45
How to Evaluate Youth	17
Key Projects	31
Program Safety and Liability	46
Understanding Diversity	40
Volunteer Management Systems	33
Youth/Adult Partnerships	48

Summary of Subjects Taught

Subject	# Programs Conducted

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
500	153	522	3,758	1,475	21,187	13,958	18,686	8,457	13,910	41,053

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			

	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	24	24	678	74	2,067	3	2,046	810	0	2,856
Email	0	0	514	102	3,511	1,123	3,451	1,054	766	5,271
Office Visit	2	2	1,979	283	9,088	734	6,327	5,112	734	12,173
Radio/TV	50	50	50,00	25,000	118,449	38,442	97,100	97,099	37,942	232,141
Telephone	20	20	1,439	289	8,577	2,979	6,858	3,611	2,954	13,423
Web Site	0	0	15	0	45	15,742	50	10	15,742	15,802
Total all Contacts	96	96	54,62	25,748	141,737	59,023	115,832	107,696	58,138	281,666

Summary of Programs for Target Audiences

Target Audience	# Programs Conducted
Extension Faculty	15
Volunteers	52

Summary of Programs for Primary Audiences

Target Audience	# Programs Conducted
4H EFNEP Volunteers	8
Certified, Master or Key Project Volunteers	35
County Extension Directors	8
County Extension Faculty	12
County Extension Faculty with 3 years	1
District Extension Directors	7
Episodic Volunteers	25
Family Volunteers	34
Judges/Coaches for Events and Activities	31
Senior Volunteers	25
State Extension Faculty with 3 years	1
State Extension Faculty with 4-	1
Volunteers in Program Management Roles	45
Youth 11-13 (grades 6-8) years of age	10
Youth 14-18 (grades 9-12) years of age	22
Youth 5-7 (grades K-2) years of age	1
Youth 8-10 (grades 3-5) years of age	3
Youth Volunteers all ages	15
Youth all ages (K-12)	6

Outcomes Accomplished by Focus Area

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Improve Competencies to Deliver Youth Programs		814
Volunteers Completing 3-Hour Training for Short-Term Volunteer Role	236	186
Volunteers Completing 6-Hour Core Competencies Training	280	184
Volunteers Completing 8-Hour Master/Managing/Coordinating Training	18	18

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Volunteers will adopt best management practices related to diversity.	62	36

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Improve Competencies to Deliver Youth Programs	840	330

Teamwork and cooperation	390	390
Volunteers Understand how to Create a Caring Environment for Youth	666	608

Type of Outcome: Skills Developed

Outcome	Evaluate	Making Change
Develop increased Self-Esteem / Self-Confidence	589	554
Teamwork and cooperation	66	60
Volunteers Understand how to Create a Caring Environment for Youth	70	70

Focus Area 3: Life Skills Developed in Youth Through Subject Matter experiences

Summary of Topics Addressed

Topic	# Programs Conducted
Ag in the Classroom	1
Agricultural Awareness and Literacy	42
Animal Sciences	72
Child Development	2
Citizenship	57
Clothing and Textiles	2
Communication Arts	82
Embryology	2
Environmental Ecology and Natural Resour	83
Healthy Lifestyles Choices	76
Individual & Family Resources	74
Leadership	67
Leisure Arts and Recreation	44
Outdoor Education	2
Personal Development	6
Plant Sciences	56
Science and Technology	37
Wildlife Ecology	1

Summary of Subjects Taught

Subject	# Programs Conducted

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
4,847	2,511	6,999	109,816	65,155	344,57	149,378	288,217	242,154	148,063	678,434

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	24	24	678	74	2,067	3	2,046	810	0	2,856
Email	0	0	514	102	3,511	1,123	3,451	1,054	766	5,271
Office Visit	2	2	1,979	283	9,088	734	6,327	5,112	734	12,173
Radio/TV	50	50	50,00	25,000	118,449	38,442	97,100	97,099	37,942	232,141
Telephone	20	20	1,439	289	8,577	2,979	6,858	3,611	2,954	13,423
Web Site	0	0	15	0	45	15,742	50	10	15,742	15,802
Total all Contacts	96	96	54,62	25,748	141,737	59,023	115,832	107,696	58,138	281,666

Summary of Programs for Target Audiences

Summary of Programs for Primary Audiences

Target Audience	# Programs Conducted
Extension Faculty	22
Volunteers	105
Youth	141

Target Audience	# Programs Conducted
4H EFNEP Volunteers	8
4H EFNEP Youth	11
Certified, Master or Key Project Volunteers	29
Club Volunteers	77
County Extension Directors	5
County Extension Faculty	20
County Extension Faculty with more than 7	1
Judges/Coaches for Events and Activities	49
Organizations -- Community	38
Resource Volunteers	50
School teachers	52
School Teachers -- Grades 6-8	22
School Teachers -- Grades 9-12	18
School Teachers -- Grades K-5	29
Volunteer Teams	20
Youth 11-13 (grades 6-8) years of age	112
Youth 14-18 (grades 9-12) years of age	105
Youth 5-7 (grades K-2) years of age	48
Youth 8-10 (grades 3-5) years of age	108
Youth all ages (K-12)	86

Outcomes Accomplished by Focus Area

Type of Outcome: Attitude Change

Outcome	Evaluate	Making Change
Develop Competencies in Citizenship and Civic Engagement	655	555

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Develop Competencies in Citizenship and Civic Engagement	260	195
Develop Increased Competencies in Personal Ethics/Character	630	624
Develop increased Self-Esteem / Self-Confidence	2,990	2,096
Develop Increased Self-Responsibility	2,798	2,710
Develop Positive Relationship Skills With Others	1,326	1,272
Develop Positive Social Skills	376	372

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Develop Competencies in Citizenship and Civic Engagement	1,205	1,055
Develop Healthy Lifestyle Choices	5,463	5,406
Improve Competencies to Deliver Youth Programs	100	80

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Develop Communication Skills.	29,792	29,422
Develop Competencies in Citizenship and Civic Engagement	7,800	7,255
Develop Competencies of Goal-Setting, Planning and Organizing	106	106
Develop Decision-Making, Problem-Solving and Critical Thinking Skills	2,548	2,446
Develop Employability and Workforce Preparation Skills	680	570

Develop Healthy Lifestyle Choices	10,176	8,667
Develop increased Self-Esteem / Self-Confidence	0	0
Develop Increased Self-Responsibility	3,786	1,620
Improve Agriculture and Environmental Knowledge/Skills	10,342	9,829
Improve Animal Sciences Skills	7,436	7,062
Improve Competencies to Deliver Youth Programs	596	596
Improve Family and Consumer Skills	2,792	2,570
Improve Science and Technology Skills	2,436	2,542

Type of Outcome: Skills Developed

Outcome	Evaluate	Making Change
Develop Communication Skills.	24,436	22,950
Develop Competencies in Citizenship and Civic Engagement	260	250
Develop Competencies of Goal-Setting, Planning and Organizing	2,556	1,916
Develop Decision-Making, Problem-Solving and Critical Thinking Skills	4,132	4,014
Develop Employability and Workforce Preparation Skills	120	94
Develop Healthy Lifestyle Choices	1,650	1,281
Develop Increased Competencies in Personal Ethics/Character	422	398
Develop Leadership Skills	1,602	1,399
Improve Animal Sciences Skills	1,928	1,896
Improve Competencies to Deliver Youth Programs	0	0
Improve Family and Consumer Skills	3,490	3,562
Improve Science and Technology Skills	300	300

Impacts Expected from Focus Area	Number of Programs Expecting this Impact
Impact	
Youth are actively engaged in their own development.	142
Youth are physically and emotionally safe	10
Youth develop a sense of belonging, in an inclusive environment	35
Youth develop knowledge and skills necessary for work and family life.	133
Youth grow and contribute as active citizens through service and leadership.	44
Youth will develop and maintain positive relationships with others	24

Success Stories for Planned Program 3

Source of funds: Smith-Lever

Scope: integrated, multistate, state

States Involved: To develop responsible and productive youth through 4-H and other youth programs
AL, CA, CO, CT, FL, GA, ID, IN, KS, KY, LA, MD, MO, MS, NC, OH, OK, PA, SC, TN, TX, VA, WV

Planned Program 4: To create and maintain Florida friendly landscapes: The smart way to grow

Long Term

National Goals: 1, 4

KEY THEMES: Agricultural Waste Management, Air Quality, Biodiversity, Biological Control, Drought Prevention and Mitigation, Endangered Species, Energy Conservation, , Forest Resource Management, Global Change and Climate Change, Hazardous Materials, Integrated Pest Management, Land Use, Natural Resources Management, Nutrient Management, Pesticide Application, Recycling, Riparian Management, Soil Erosion, Soil Quality, Water Quality, Weather and Climate, Wetlands Restoration and Protection, Wildfire Science and

Management, Wildlife Management, Yard Waste/Composting, Home Lawn and Gardening, Invasive Species, Ornamental/Green Agriculture, Tropical Agriculture, Urban Gardening

Statement of Issue

Florida has millions of acres of lawns and landscapes, the majority of which receive some type of management and inputs of fertilizers or pesticides. With increased emphasis on reduction of non-point source pollution and preservation of Florida's natural water resources, careful management of lawns and landscapes is critical.

In Planned Program 4 there are three focus areas:

1. Commercial Horticultural/Urban Forestry Services
2. Florida Yards and Neighborhoods (FYN)
3. Residential landscapes

Focus Area 1: Commercial Horticultural/Urban Forestry Services

Summary of Topics Addressed

Topic	# Programs Conducted
Agricultural Awareness and Literacy	1
Business Management	14
Diagnostic Services	9
Diagnostics	19
Integrated Landscape BMPs	29
Ornamental & Tree BMPs Only	28
Pesticide Safety Education (PSE)	26
Plant Sciences	11
Public Policy	7
Soils & Fertilizers	16
Turfgrass BMPs only	19

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
956	85	523	9,862	9,251	59,581	190,243	33,336	46,103	190,106	269,545

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	2	2	441	238	4,530	76	2,017	3,134	209	5,360
Email	5	5	89	109	1,522	34,950	965	1,205	34,524	36,694
Office Visit	23	23	675	576	3,979	21	2,152	3,176	21	5,349
Radio/TV	0	0	2,020	1,640	11,500	1,870,720	6,840	9,160	1,870,000	1,886,000
Telephone	50	50	1,838	1,868	8,572	28,673	4,356	8,481	28,322	41,159
Web Site	0	0	94	200	2,516	170,926	1,675	1,714	170,347	173,736
Total all Contacts	80	80	5,157	4,631	32,619	2,105,366	18,005	26,870	2,103,423	2,148,298

Summary of Programs for Target Audiences **Summary of Programs for Primary Audiences**

Target Audience	# Programs Conducted
Extension Faculty	15
Professional Horticulture Services/Urban	34

Target Audience	# Programs Conducted
Builders and Developers	14
Business Owners and Managers	22
County Extension Faculty	14
Homeowners associations	10
Pesticide Applicators	28
Policymakers	13
Professional Horticulture Services	30
Property Managers	25
Recreational Turf Managers	25
Retail and Allied Services	22
State Extension Faculty	2
Tree Care Providers	27

Outcomes Accomplished by Focus Area

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Able to calibrate and set timer for irrigation system	144	132
Able to correctly follow pesticide labels.	1,137	981
Able to make minor repairs to irrigation system	108	48
Able to match plants to site conditions.	108	80
Able to perform basic pest identification	297	216
Appropriate pruning techniques to correct shrub structure and health	0	0
Increased usage of diagnostic services	54	24

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Able to match plants to site conditions.	384	360
Demonstrate satisfactory competence in pesticide knowledge and skills.	90	90
Describe "Integrated Pest Management" and several tactics commonly used in IPM.	942	897
Have an awareness of environmental and site conditions at time of fertilizer applications	435	324
List procedures for minor and major chemical spills.	333	306
Participants make fertilizer recommendations for a given plant situation.	96	96
Participants select plant varieties (species or cultivars) to fulfill landscape design requirements.	72	57

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Able to calibrate and set timer for irrigation system	114	63
Able to correctly follow pesticide labels.	264	258
Able to determine appropriate product/service prices.	112	108
Able to evaluate irrigation system for use and site conditions	456	432
Able to make minor repairs to irrigation system	152	72
Able to match plants to site conditions.	3,748	3,356
Able to name/describe components/characteristics of soil or growing media.	96	96
Able to perform basic pest identification	624	609

Able to read and understand a fertilizer label.	260	238
Able to understand the cause and prevention of common nutritional deficiences.	244	242
Agencies responsible for regulating pesticide application in Florida	130	121
Appropriate pruning techniques to correct shrub structure and health	192	192
Aware of pesticide appropriate behaviors, actions, procedures or PPE.	131	124
Awareness of local irrigation requirements and water restrictions.	111	102
Categorize major groups of insects by mouthparts and explain relation to pest control.	122	106
Cultural methods of pest management	366	315
Describe characteristcs, advantages and disadvantages of common Florida turfgrasses.	536	468
Describe environmental conditions, causes and symptoms of major landscape diseases.	308	178
Describe general characteristics of the 3 major weed classifications.	122	86
Describe important plant processes such as photosynthesis and transpiration.	0	0
Describe several methods of staking trees.	304	290
Describe the 3 classifications of plants based on life cycle and apply to common ornamental plants.	0	0
Describe the 7 basic principles of Xeriscape and how they relate to landscape design.	200	200
Describe the factors that influence whether pesticides will move offsite in either water or air.	222	204
Describe the procedure for calibrating a fertilizer spreader.	46	42
Describe the procedure to take a tissue sample.	98	98
Describe the procedure to take samples for disease identification.	236	150
Describe the relationship between plant life cycles and weed control.	38	38
Describe the types and symptoms of heat-related illnesses.	86	86
Describe what to do when a pesticide container leaks.	222	204
Explain how to avoid the development of pesticide resistance.	222	204
Explain how to establish and maintain a safe pesticide storage site.	192	168
Explain the 3-cut method of large branch removal.	1,518	1,224
Explain the benefits of pesticide application recordkeeping.	192	168
Florida pesticide laws and regulations	130	121
Have an awareness of environmental and site conditions at time of fertilizer applications	57	57
Have an understanding of pH and the materials that can raise or lower pH.	52	30
Have an understanding of the structures, functions and life cycle of trees.	228	228
Have an understanding of the various components of fertilizers.	734	576
Have an understanding of the various components of the term "site conditions."	100	56
Have awareness of appropriate customer service skills.	960	622
Identify common diseases of ornamentals.	170	154
Identify common diseases of palms.	68	66
Identify common diseases of the major turfgrasses.	192	168
Identify common diseases of trees.	38	38
Identify common insect pests of ornamentals.	280	278
Identify common insect pests of palms.	38	38
Identify common insect pests of trees.	38	38
Increased knowledge of sampling and monitoring procedures and pest thresholds	36	32
Knowledge of pesticide handling practices, procedures, equipment, or facilities.	111	102
List procedures for minor and major chemical spills.	57	57

List safety precautions when transporting pesticides in vehicle.	222	204
List the four pesticide routes of entry.	38	38
Name and describe characteristics of the major organisms which commonly cause plant diseases.	15	15
Name and describe several different types of herbicide formulations.	38	38
Name and describe several types of organisms that can cause plant problems.	170	164
Name and explain the meaning of signal words.	38	38
Name several types of pruning and describe the effects of each on plant growth.	1,992	1,676
Participants select plant varieties (species or cultivars) to fulfill landscape design requirements.	621	612
Scouting a landscape	38	38
Understand how nutrients are used by the plant.	512	374
Understand specific accounting measures to determine business costs and profitability	16	12

Type of Outcome: Skills Developed

Outcome	Evaluate	Making Change
Able to evaluate irrigation system for use and site conditions	54	8
Able to perform basic pest identification	9,348	8,847
Describe what to do when a pesticide container leaks.	180	180
Identify common mistakes of chain saw use.	402	264
Name several types of pruning and describe the effects of each on plant growth.	46	46
Participants make fertilizer recommendations for a given plant situation.	117	117

Focus Area 2: Florida Yards and Neighborhoods (FYN)
Summary of Topics Addressed

Topic	# Programs Conducted
Agricultural Awareness and Literacy	1
FYN Marketing	9
Landscape Design, Installation &	20
Landscape Management of Ornamentals a	27
Public Policy	9
Volunteer development	11

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
482	10	501	3,503	2,643	40,750		27,967	21,197		49,164

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	29	14	481	128	293	241	126	660
Email	0	0	10	19	774	13,797	698	584	13,321	14,603
Office Visit	1	1	103	54	1,590	2,425	905	866	2,415	4,186
Radio/TV	0	0	0	0	0	15,432,00	0	0	15,432,000	15,432,000
Telephone	0	0	71	54	1,509	17,271	5,980	4,658	8,289	18,927
Web Site	0	0	0	0	0	323,279	0	0	323,279	323,279
Total all Contacts	1	1	213	141	4,354	15,788,900	7,876	6,349	15,779,430	15,793,655

Summary of Programs for Target Audiences

Target Audience	# Programs Conducted
Commercial Horticulture	20
Educators	16
Extension Faculty	8
Florida Residents	26
IFAS Administrators/Supervisors	3
Volunteers	14

Summary of Programs for Primary Audiences

Target Audience	# Programs Conducted
4H (K-12)	3
Adults	25
Builders and Developers	9
Business Owners and Managers	6
Community Educators and Planners	13
County Extension Directors	3
County Extension Faculty	9
Florida Yard Advisors	6
Funding Agencies	10
Homeowners associations	22
Irrigation design/installation contractors	6
Landscape designers,	11
Master Gardeners	17
Pesticide Applicators	9
Policymakers	11
Professional Horticulture Services	13
Property Managers	14
Public land managers	8
Public/Private Schools	6
Recreational Turf Managers	8
Retail and Allied Services	7
State Extension Faculty	3
Youth all ages (K-12)	12

Outcomes Accomplished by Focus Area

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Development of FYN demonstrations	140	132

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Efficient use of inputs for landscape management	868	634

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Development of FYN demonstrations	2,888	2,824
More environmentally informed/aware youth, adults and voters.	7,158	6,101

Focus area 3: Residential landscape

Summary of Topics Addressed

Topic	# Programs Conducted
Diagnostic Services	48
Diagnostics -- Interpreting results	63
Home Fruit & Vegetable Gardening	46

Landscape associated biosecurity risks	19
Landscape Design, Installation &	58
Landscape Management of Ornamentals a	87
Plant Pest Diagnosis	78
Volunteer Leadership, Development, and	56
Volunteer Management Systems	29

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total

Numbers not available

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	32	32	896	650	9,032	1,475	5,930	5,453	864	12,247
Email	0	0	195	646	5,768	18,874	8,933	5,294	11,290	25,517
Office Visit	70	70	4,469	10,566	52,165	6,100	34,829	34,621	5,346	74,796
Radio/TV	525	525	17,90	23,000	265,082	50,803,32	170,001	144,001	50,799,329	51,113,331
Telephone	89	89	9,496	15,222	65,254	94,936	85,688	74,223	26,891	186,802
Web Site	0	0	5,015	2	189,863	241,918	70,911	121,665	244,422	436,998
Total all Contacts	716	716	37,97	50,086	587,164	51,166,627	376,292	385,257	51,088,142	51,849,691

Summary of Programs for Target Audiences

Audiences

Target Audience	# Programs Conducted
Extension Faculty	17
Florida Residents	90
Solicitors of professional landscape	51

Summary of Programs for Primary

Target Audience	# Programs Conducted
Adults	55
Beach resorts	10
Business Owners and Managers	19
Commercial diagnostic service	9
County Extension Directors	1
County Extension Faculty	15
County Extension Faculty with 3 years	1
Department of Transportation	3
Golf clubs	11
Homeowners	79
Homeowners associations	30
Landscape Design, Installation, and	33
Landscape managers	38
Lawn maintenance service providers	39
Master Gardeners	61
Parks and trails	20
Private and public golf clubs	14
Property managers -- commercial	23
Rental property managers	14
State Extension Faculty	5
Urban forestry service	10
Youth all ages (K-12)	33

Outcomes Accomplished by Focus Area

Type of Outcome: Attitude Change

Outcome	Evaluate	Making Change
Develop or Refine Speakers Bureau	90	90
Improved Community Relations	348	348
Maintains Landscape in an Environmentally Friendly Manor	4,156	3,924
Make Landscape Changes to Attract Wildlife	2,316	2,316
Positive Client Experience	2,772	2,644

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Develop and Utilize Demonstration Garden	456	456
Efficient use of inputs for landscape management	123	120
Increase usage of and demand for diagnostic services.	30	30
Maintains Landscape in an Environmentally Friendly Manor	1,520	1,068

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Decreased landscape costs, pesticide usage, landscape call backs, disease problems, improper pesticide usage.	12,348	7,824
Efficient use of inputs for landscape management	27	27
Improved diagnostic/identification skills/services, landscape maintenance services, and pesticide usage.	1,575	1,542
Maintains Landscape in an Environmentally Friendly Manor	2,856	1,892

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Decreased landscape costs, pesticide usage, landscape call backs, disease problems, improper pesticide usage.	12,832	12,016
Develop and Utilize Demonstration Garden	75	69
Efficient use of inputs for landscape management	4,053	4,041
Identify Pests and Process Samples	2,576	2,574
Improved diagnostic/identification skills/services, landscape maintenance services, and pesticide usage.	2,448	2,442
Increased awareness of plant pest problems, available diagnostic services, biosecurity risks, control choices.	2,734	2,386
Increased number of species observed in landscape	210	206
Maintains Landscape in an Environmentally Friendly Manor	1,804	1,748
Make Landscape Changes to Attract Wildlife	966	966
More environmentally informed/aware youth, adults and voters.	10,686	9,088
Positive Client Experience	3,398	3,380

Type of Outcome: Number of Adult Participants

Outcome	Evaluate	Making Change
Improved Visibility for UF/IFAS	N/A	N/A
Increase the Number of Master Gardener Volunteers	N/A	2,130

Type of Outcome: Number of County Events

Outcome	Evaluate	Making Change
Improved Visibility for UF/IFAS	N/A	N/A

Type of Outcome: Percent

Outcome	Evaluate	Making Change
Increase the Number of Master Gardener Volunteers	324	261

Type of Outcome: Skills Developed

Outcome	Evaluate	Making Change
Decreased landscape costs, pesticide usage, landscape call backs, disease problems, improper pesticide usage.	2,024	2,008
Develop and Utilize Demonstration Garden	1,239	1,239
Develop or Refine Speakers Bureau	183	75
Identify Pests and Process Samples	130	120
Improved diagnostic/identification skills/services, landscape maintenance services, and pesticide usage.	585	402

Success Stories for Planned Program 4
Source of funds: Smith-Lever
Scope: integrated, multistate, state

States Involved: To create and maintain Florida friendly landscapes: The smart way to grow
AL, DC, FL, GA, MS, PA, TN

Planned Program 5: To assist individuals and families to achieve economic well-being and life quality

Long Term
National Goals: 2, 3, 5

KEY THEMES: Food Accessibility and Affordability, Food Handling, Food Quality, Food Recovery/Gleaning, Food Resource Management, Food Safety, Food Security, Foodborne Illness, Foodborne Pathogen Protection, HACCP, Birth Weight, Health Care, Human Health, Human Nutrition, Infant Mortality, Medicinal Plants, Nutricueticals, Aging, Agricultural Financial Management, Character/Ethics Education, Child Care/Dependent Care, Children Youth and Families at Risk, Communications Skills, Conflict Management, Consumer Management, Estate Planning, Family Resource Management, Farm Safety, Fire Safety, Home Safety, Home-based Business Education, Jobs/Employment, Leadership Training and Development, Literacy, Parenting, Promoting Business Programs, Promoting Housing Programs, Retirement Planning, Supplemental Income Strategies, Tourism, Workforce Preparation – Youth and Adult, Workforce Safety, Youth Development/4-H, Youth Farm Safety

Statement of Issue

Florida is a rapidly growing state with a very diverse population. Many Floridians face special needs and issues that must be addressed. People are living longer – but not planning adequately for retirement, a time when costs for medical services and living assistance can be significant. Florida has the highest percentage of residents over the age of 65 in the nation. Lifestyle related chronic illnesses, such as diabetes, obesity, and circulatory diseases are on the rise. Poor food choices create health and developmental related problems for people of all ages, and are of critical concern for young mothers and their infants. Florida is one of the top 10 states nationwide in the

incidence of food-borne diseases. Of these, about half are attributed to food service operations. Health care costs are increasing more rapidly than other costs, and many people are without healthcare insurance.

Personal indebtedness, especially credit card debt is at an all-time high and savings at an all-time low. Although the state and nation is moving toward automation and a cashless society, many Floridians, especially low income families and recent emigrants from third-world nations do not use any type of banking service; most are poor managers of their finances. More than one-fourth of Florida's adults have difficulty making accurate change in a financial transaction. Low-to-moderate income families are finding it difficult to find affordable housing. During the ten-year period of 1992-2002 housing costs increased from 20.2 percent to 35 percent of an average household income. The structural integrity of residences or ability to withstand hurricanes and other severe weather conditions is now becoming an important concern of Floridians. Also, the indoor air quality of a residence can affect the health of its residents, especially those with respiratory problems such as asthma, a major problem with children in Florida.

Florida's families are diverse and include teenage parents, single parents, duel earner families, stepparents, grandparents raising grandchildren, and traditional two-parent families. Single parents head almost one-third of the families. With 57 percent of the women with children under the age of 6 and 66 percent of those with children 6 to 17 employed there is a critical need for affordable, quality childcare.

Extension uses unpaid volunteers to expand its outreach programs. The volunteers contribute to the development of their communities and provide social capital through the development of their leadership capabilities and cooperative work. They generate cross-community channels of communication and receive training that benefits both the individuals and their communities.
Planned Progam 5 has 5 focus areas:

1. Financial Management and Economic Well-Being
2. Housing and Environment
3. Nonprofit Organizations, Leadership and Volunteer Development
4. Nutrition, food safety, and health
5. Personal and Family well-being

Focus Area 1: Financial Management and Economic Well-Being
Summary of Topics Addressed

Topic	# Programs Conducted
Consumer Safety	10
Consumer Competency	23
Credit/Debt Management	29
Financial Literacy	35
Financial Security Later in Life	16
Marketplace Performance	5
Protecting Your Assets	10

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
474	21	316	8,623	4,178	11,631	1,404	16,331	8,591	1,251	26,173

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	355	96	1,086	12	712	831	12	1,555
Email	0	0	308	28	1,792	252	1,765	371	252	2,388

Office Visit	0	0	83	18	240	10	280	64	7	351
Radio/TV	0	0	30,00	200	70,000	1,445,358	56,112	44,088	1,445,358	1,545,558
Telephone	0	0	446	65	1,510	664	1,815	599	292	2,706
Web Site	0	0	44	16	396	26,850	317	142	26,850	27,309
Total all Contacts	0	0	31,23	423	75,024	1,473,146	61,001	46,095	1,472,771	1,579,867

Summary of Programs for Target Audiences Audiences

Target Audience	# Programs Conducted
Adults	35
Advisory Committee	7
Extension Faculty	7
Older Adults	28
Youth	21

Summary of Programs for Primary

Target Audience	# Programs Conducted
Adults	31
County Extension Directors	2
County Extension Faculty	7
District Extension Directors	1
Extension Advisory Committees	7
Farm Families	5
Limited Resource Families	28
Middle Income Adults	22
State Extension Faculty with 3 years	1
State Extension Faculty with 7 or more year	1
Youth 11-13 (grades 6-8) years of age	8
Youth 14-18 (grades 9-12) years of age	13
Youth 5-7 (grades K-2) years of age	2
Youth 8-10 (grades 3-5) years of age	5
Youth At Risk	6
Youth all ages (K-12)	6

Outcomes Accomplished by Focus Area

Type of Outcome: Attitude Change

Outcome	Evaluate	Making Change
Using financial institutions to protect their finances and/or assets	180	156

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Comparison shopping	928	544
Develop and maintain strategy to protect financial assets	956	892
Develop strategies for increasing wealth by using savings and investments.	576	528
Develop strategies to evaluate and use insurance policies	664	288
Manage credit and debt to achieve family goals	724	568
Record keeping and financial planning systems	1,228	964
Strategies for increasing wealth through savings and investments	425	170
Strategies to manage debt	932	576
Use reliable information for purchases to avoid fraud and deceptions	428	468

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Develop strategies for increasing wealth by using savings and investments.	628	628
Manage credit and debt to achieve family goals	76	28
Record keeping and financial planning systems	196	168
Strategies to manage debt	248	184

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Comparison shopping	632	588
Develop and maintain strategy to protect financial assets	1,348	1,152
Develop strategies for increasing wealth by using savings and investments.	1,312	1,128
Develop strategies for reducing taxes	4,224	4,176
Develop strategies to evaluate and use insurance policies	4,124	3,972
Manage credit and debt to achieve family goals	4,952	4,100
Record keeping and financial planning systems	11,776	11,264
Strategies to manage debt	696	688
Use reliable information for purchases to avoid fraud and deceptions	24	24
Using financial institutions to protect their finances and/or assets	624	452

Type of Outcome: Skills Developed

Outcome	Evaluate	Making Change
Comparison shopping	20	20
Develop and maintain strategy to protect financial assets	32	28
Develop strategies for increasing wealth by using savings and investments.	140	140
Manage credit and debt to achieve family goals	1,872	232
Record keeping and financial planning systems	1,672	1,324
Strategies for increasing wealth through savings and investments	655	480
Strategies to manage debt	104	104
Using financial institutions to protect their finances and/or assets	600	488

Focus Area 2: Housing and Environment

Summary of Topics Addressed

Topic	# Programs Conducted
Fraud/Financial Risks	10
Home Building/Remodeling: Construction	19
Home Building/Remodeling: Regulatory	14
Home Environment	23
Home Furnishings/Interior Design	15
Home Ownership Affordability	19
Home Purchasing/Housing Options	14
Maintenance/Upkeep/Renovation	17
Safety	17

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
290	47	241	5,075	2,778	13,037	43,999	12,776	8,751	43,650	65,177

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	136	10	354	12	356	147	12	515
Email	0	0	108	119	1,236	503	932	531	503	1,966

Office Visit	0	0	435	65	1,017	1,052	815	704	1,052	2,571
Radio/TV	0	0	12	0	430	766,000	11	441	766,000	766,452
Telephone	1	1	767	397	3,165	644	2,983	1,665	329	4,977
Web Site	0	0	0	0	0	205,410	0	0	205,410	205,410
Total all Contacts	1	1	1,458	591	6,202	973,621	5,097	3,488	973,306	981,891

Summary of Programs for Target Audiences Audiences

Target Audience	# Programs Conducted
County Extension Faculty	6
General Public	32
Home Buyers	23
IFAS Administrators/Supervisors	2
Professional/Business	15

Summary of Programs for Primary

Target Audience	# Programs Conducted
4H (K-12)	2
Builders and Developers	12
Business -- Banking/Finance Professionals	3
Child Care Professionals	2
County Extension Faculty	6
Developers	4
Homebuyers -- First Time	21
Homeowners	21
Limited Resource Families	18
Physically Challenged	6
Property Managers	6
Prospective Homebuyers	19
Renters	20
Repeat Homebuyers	11
Sales Professionals	5
Seasonal owners/renters	9
Senior Citizens	11
Youth all ages (K-12)	5

Outcomes Accomplished by Focus Area

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Participants, especially lower income, resolve credit problems and qualify for home loans.	306	114
Program participants evaluate housing options and choose/buy a home fitting family needs/finances.	306	318
Program participants will develop and follow a spending plan and pay their housing expenses.	270	135
Program participants will increase knowledge about energy efficient construction methods, materials, and equipment.	820	326
Program participants will inspect their homes and make changes needed to protect them.	28	28
Program participants will learn to conserve and protect the quality of water.	0	0
Program participants will learn to conserve energy by using it wisely.	0	0
Program participants will maintain their residences in condition for quality living.	1,314	1,083

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Contractors increase knowledge of home construction skills.	816	802

Participants increase knowledge about environmentally sound homesites, landscape designs, and water management.	684	642
Participants increase knowledge about finance, costs, loans, and working with financial professionals.	1,497	1,482
Participants, especially lower income, resolve credit problems and qualify for home loans.	555	555
Program participants evaluate housing options and choose/buy a home fitting family needs/finances.	2,037	1,755
Program participants learn how to close homes for extended periods.	0	0
Program participants will develop and follow a spending plan and pay their housing expenses.	0	0
Program participants will increase knowledge about energy efficient construction methods, materials, and equipment.	972	894
Program participants will increase knowledge about the Occupational Safety and Health Act.	132	132
Program participants will increase knowledge of building codes and other related regulations.	1,548	1,548
Program participants will learn about lead-based paint risks and disclosure information.	0	0
Program participants will learn how to qualify, shop for, and select home financing.	600	560
Program participants will learn to conserve and protect the quality of water.	237	237
Program participants will learn to conserve energy by using it wisely.	228	213
Program participants will learn to read and understand their leases and other documents.	196	138
Program participants will learn to recognize environmental hazards and asthma triggers.	230	230
Program participants will maintain their residences in condition for quality living.	687	558
Program participants will modify their residences for independent living.	360	360

Type of Outcome: Skills Developed

Outcome	**Evaluate**	**Making Change**
Contractors increase knowledge of home construction skills.	0	0
Participants increase knowledge about finance, costs, loans, and working with financial professionals.	405	399
Participants use reliable information and practices related to purchasing goods and services.	44	22
Participants, especially lower income, resolve credit problems and qualify for home loans.	951	126
Program participants evaluate housing options and choose/buy a home fitting family needs/finances.	195	195
Program participants learn how to close homes for extended periods.	280	266
Program participants will learn how to qualify, shop for, and select home financing.	270	260
Program participants will learn to recognize environmental hazards and asthma triggers.	66	66
Program participants will maintain their residences in condition for quality living.	462	444

Focus Area 3: Nonprofit Organizations, Leadership and Volunteer Development

Summary of Topics Addressed	**# Programs**	**Summary of Subjects Taught**	**# Programs**

Topic	Conducted
Financial documents for the nonprofit	5
Fund raising for the nonprofits in Florida	5
Marketing for the nonprofit organization	10
Nonprofit organizations and governance	5
Public Relations for the nonprofit	8
Strategic planning for nonprofit	5
The controlling documents of the nonprofit	2
The nonprofit leadership education program	11
Volunteer development	21

Subject	Conducted
Background Info: Programming implications for extensions work with nonprofits	1
Background Info: Scope of Nonprofit Sector	1
Background Info: Type of Nonprofit Organization	1
Board Development and Effectiveness	5
Education Programs and Delivery	11
Financial Documents: Chart of accounts and Record-keeping	5
Financial Documents: Tax Returns	1
Fundraising: Types	5
Marketing	10
Public Relations	8
Sarbanes Oxley Legislation and Implications for Nonprofits.	1
Strategic Plan: Conduct Strategic Planning Session	4
Strategic Plan: Conducting an Environmental Analysis	1
Strategic Plan: Implement Plan	3
Strategic Plan: Obtaining Support from Key Leaders	2
Strategic Plan: Securing Involvement from Key Leaders and Other Influentials	2
The NPO Articles of Incorporation	1
The NPO Committee Roles and responsibilities	2
The NPO Generic Bylaws	2
The NPO officer roles and responsibilities	2
The NPO application for letter of exemption	1
Volunteer Development: Evaluation	7
Volunteer Development: Orientation	9
Volunteer Development: Recognition	12
Volunteer Development: Supervision	15
Volunteer Development: Training/Education	18
Voluteer Development: Recruitment	12

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
252	57	3,338	41,988	4,688	106,34	625	122,351	33,425	1,260	157,036

Clientele Contacts Summary for Focus Area

Ethnicity	Gender

	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	53	18	1,418	0	1,027	467	0	1,494
Email	0	0	13	2	364	62	369	10	62	441
Office Visit	0	0	28	3	462	1	481	13	1	495
Radio/TV	0	0	0	0	0	17,000	0	0	17,000	17,000
Telephone	0	0	74	0	1,751	0	1,806	21	0	1,827
Web Site	0	0	0	0	0	6,600	0	0	6,600	6,600
Total all Contacts	0	0	168	23	3,995	23,663	3,683	511	23,663	27,857

Summary of Programs for Target Audiences
Audiences

Target Audience	# Programs Conducted
Community Groups or Programs	4
Elected Officials	6
Extension Faculty	4
IFAS Administrators/Supervisors	2
Non-Profits (local or regional)	20
Professional Associations	6
Volunteers	9

Summary of Programs for Primary

Target Audience	# Programs Conducted
4H (K-12)	2
Community College Leadership Programs	2
County Extension Directors	1
County Extension Faculty	5
County Extension Faculty with 3 years	1
County Extension Faculty with 4 - 7 years	1
County Extension Faculty with more than 7	1
District Extension Directors	1
Family and Community Educators (FCE)	18
Officers and Members	13
Organizations -- Chambers of Commerce	6
Organizations -- Leadership Groups	6
Organizations -- Natural Resource Groups	3
State Extension Faculty with 3 years	1
State Extension Faculty with 4-	1
State Extension Faculty with 7 or more year	1
Volunteer Development Coordinators	9

Outcomes Accomplished by Focus Area

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Develop Communication Skills.	88	72
Develop Competencies in Citizenship and Civic Engagement	3,393	2,982
Establish and maintain a strategic plan	0	0
Establish and maintain roles and responsibilities	72	72
Improved Extension effectiveness from collaboration with nonprofit organizations	428	428

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Establish and maintain roles and responsibilities	64	56

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Develop Competencies in Citizenship and Civic Engagement	156	156
Develop Competencies of Goal-Setting, Planning and Organizing	1,860	1,828
Develop Leadership Skills	1,088	1,040

Establish and maintain roles and responsibilities	104	104
Improved understanding of community characteristics, needs, and assets.	24	24
Unnderstanding of community and the role of nonprofit organizations	1,280	160

Type of Outcome: Skills Developed

Outcome	Evaluate	Making Change
Adequate financial resources exist to meet goals and objectives	0	0
Develop Communication Skills.	308	204
Develop Competencies in Citizenship and Civic Engagement	156	156
Develop Competencies of Goal-Setting, Planning and Organizing	1,740	1,616
Develop Leadership Skills	324	202
Establish and maintain roles and responsibilities	24	16

Focus Area 4: Nutrition, food safety, and health

Summary of Topics Addressed

Topic	# Programs Conducted
Agricultural Awareness and Literacy	1
Cancer Risk Reduction	31
Elder Nutrition and Health	35
Food Safety and Handling	53
Food Safety and Quality -- Current Issues	28
Managing Type 2 Diabetes	19
Maternal and Child Health	40
Nutrition and Health -- Current issues	51
Nutrition for Sports Success	5
Promoting Cardiovascular Health	28
Tools For A Healthy Lifestyle	58
Weight Management	32

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
1,930	2,175	4,987	239,123	79,286	418,12	17,736	487,471	250,577	23,386	761,434

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	75	75	18,40	10,839	6,796	548	28,838	7,566	552	36,956
Email	0	0	362	126	4,877	3,389	3,770	1,819	3,203	8,792
Office Visit	0	0	277	110	2,072	1,142	1,606	854	1,149	3,609
Radio/TV	0	0	15,00	100	35,000	3,056,052	28,056	22,044	3,056,052	3,106,152
Telephone	18	18	2,694	1,477	7,864	36,415	10,395	3,266	34,857	48,518
Web Site	2	2	75	94	1,690	56,216	1,029	841	56,216	58,086
Total all Contacts	95	95	36,81	12,746	58,299	3,153,762	73,694	36,390	3,152,029	3,262,113

Summary of Programs for Target Audiences Audiences

Target Audience	# Programs Conducted
Consumers	71

Summary of Programs for Primary

Target Audience	# Programs Conducted
4H EFNEP Youth	4

Educators	42
Extension Faculty	10
Extension Support Staff	20
Food service establishments	27
Policy Makers and Community Leaders	11
Volunteers	32
Youth	30

4H Volunteers	7
Adults -- Overweight and obese	34
Adults with type 2 diabetes	25
Adults with blood pressure and/or blood	31
Adults with family history of cancer or	15
County Extension Directors	2
County Extension Faculty	13
County Extension Faculty with 3 years	1
County Extension Faculty with 4 - 7 years	1
County Extension Faculty with more than 7	1
District Extension Directors	2
Elders	46
Elected Officials -- State	10
Extension Advisory Committees	19
Family and Community Educators (FCE)	12
Food Handlers	24
Food Managers	24
Individuals with compromised immune syste	10
Limited Resource Families	55
Master Gardeners	2
Master Nutrition/Food Safety Educator	9
Paraprofessionals	34
Parents, guardians, and caregivers	49
Partnering agencies and organizations	20
Pregnant and Parenting Teens	18
School board members	9
School teachers	26
State Extension Faculty	4
Young Children	33
Young to middle-aged adults	34
Youth 11-13 (grades 6-8) years of age	26
Youth 14-18 (grades 9-12) years of age	27
Youth 5-7 (grades K-2) years of age	7
Youth 8-10 (grades 3-5) years of age	13
Youth At Risk	11
Youth all ages (K-12)	16

Outcomes Accomplished by Focus Area

Type of Outcome: Attitude Change

Outcome	Evaluate	Making Change
Accept physical size and choose to have a more positive body image	34	20
Develop increased Self-Esteem / Self-Confidence	36	27

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Apply food safety principles to infant feeding practices	480	375
Change high-risk lifestyle behaviors to reduce cardiovascular disease risk	2,058	1,716
Demonstrate improved blood glucose control	340	232
Drink adequate fluids before, during, and following exercise.	388	340

Encourage physical activity in children.	16,972	10,004
Monitor blood glucose regularly	560	528
Pass certification exam	77,967	63,783
Recommended exercise regime	68	68
Reduce food costs	12,204	11,296
Understanding of healthy lifestyle practices.	7,264	5,732
Use available resources such as WIC, Food Stamps, and commodities	999	819
Use cost effective strategies in planning and preparing meals and snacks.	39,864	29,216
Use food labels to make healthy choices.	54,972	43,008
Use good personal hygiene practices.	1,036	688
Use recommendations of the Dietary Guidelines for Americans to guide food and activity choices.	25,857	18,531
Use recommended cleaning and sanitizing techniques.	13,884	12,856
Use recommended food handling practices	10,888	6,588
Use thermometers as recommended to reduce risk of food borne illness.	404	244
Wash fresh fruits and vegetables before consumption	168	152

Type of Outcome: Best Practices Followed

Outcome	**Evaluate**	**Making Change**
Develop increased Self-Esteem / Self-Confidence	306	294
Pass certification exam	642	525
Understanding of healthy lifestyle practices.	1,260	1,172
Use available resources such as WIC, Food Stamps, and commodities	23,985	3,645
Use good personal hygiene practices.	0	0
Use recommended food handling practices	8,204	6,752
Wash fresh fruits and vegetables before consumption	80	80

Type of Outcome: Knowledge Gain

Outcome	**Evaluate**	**Making Change**
Change high-risk lifestyle behaviors to reduce cardiovascular disease risk	645	534
Encourage physical activity in children.	2,900	2,824
Reduce food costs	83,300	83,000
Understanding of basic nutrition.	33,660	32,486
Understanding of cancer risk factors.	400	326
Understanding of cardiovascular risk factors.	1,670	1,246
Understanding of common types of food/drug and drug/nutrient interactions.	680	600
Understanding of current food safety and quality issues.	1,202	1,176
Understanding of current nutrition and/or health issues.	72,110	72,014
Understanding of food safety issues and recommended safe food handling practices.	62,886	62,128
Understanding of healthy food preparation techniques.	56,848	56,820
Understanding of healthy lifestyle practices.	51,980	46,268
Understanding of nutrient needs throughout the lifecycle.	456	428
Understanding of potential health complications of type 2 diabetes.	896	740
Understanding of recommended food preservation methods	628	628
Understanding of risk factors for foodborne illnesses.	2,758	2,596
Understanding of techniques used by fraudulent practioners/quacks.	38	28
Understanding of the USDA Food Guide Pyramid.	76,062	73,110

Use cost effective strategies in planning and preparing meals and snacks.	3,664	3,664
Use food labels to make healthy choices.	110,696	109,312
Use good personal hygiene practices.	1,180	1,180
Use recommendations of the Dietary Guidelines for Americans to guide food and activity choices.	15,345	15,282
Use recommended cleaning and sanitizing techniques.	4	4
Use recommended food handling practices	5,352	4,908
Use thermometers as recommended to reduce risk of food borne illness.	96	56

Type of Outcome: Number planning to adopt best practice

Outcome	**Evaluate**	**Making Change**
Accept physical size and choose to have a more positive body image	20	18
Change high-risk lifestyle behaviors to reduce cancer risk	43,302	43,302
Change high-risk lifestyle behaviors to reduce cardiovascular disease risk	43,920	43,611
Demonstrate improved blood glucose control	624	488
Drink adequate fluids before, during, and following exercise.	864	342
Pass certification exam	885	714
Recommended exercise regime	132	60
Reduce food costs	280	216
Understanding of basic nutrition.	212	134
Understanding of common types of food/drug and drug/nutrient interactions.	368	332
Understanding of current food safety and quality issues.	41,398	41,398
Understanding of current nutrition and/or health issues.	1,076	958
Understanding of food safety issues and recommended safe food handling practices.	14,972	9,540
Understanding of healthy food preparation techniques.	59,814	49,384
Understanding of healthy lifestyle practices.	4,636	3,896
Understanding of nutrient needs throughout the lifecycle.	264	186
Understanding of potential health complications of type 2 diabetes.	32	6
Understanding of recommended food preservation methods	40	32
Understanding of the USDA Food Guide Pyramid.	4,140	2,800
Use available resources such as WIC, Food Stamps, and commodities	795	621
Use cost effective strategies in planning and preparing meals and snacks.	92	56
Use dietary supplements only as needed for adequate nutrient intake	75	63
Use food labels to make healthy choices.	166,852	161,456
Use good personal hygiene practices.	8,068	7,868
Use recommendations of the Dietary Guidelines for Americans to guide food and activity choices.	267	159
Use recommended cleaning and sanitizing techniques.	752	560
Use recommended food handling practices	128	96
Use thermometers as recommended to reduce risk of food borne illness.	1,004	752

Focus Area 5: Personal and Family well-being

Summary of Topics Addressed

	# Programs
Family and Human Development	34
Professional/Career Development	20

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
712	17	378	8,183	3,919	20,870	7,672	26,732	8,260	6,047	41,039

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	206	63	855	22	714	425	22	1,161
Email	0	0	1,006	925	5,961	35,589	6,924	4,649	31,908	43,481
Office Visit	0	0	488	67	2,630	37	1,771	1,438	18	3,227
Radio/TV	2	2	11,98	10,302	64,754	1,104,000	47,027	40,023	1,104,000	1,191,050
Telephone	2	2	1,048	274	2,157	2,310	3,589	1,083	1,132	5,804
Web Site	2	2	75	94	1,699	2,411	1,036	843	2,411	4,290
Total all Contacts	6	6	14,80	11,725	78,056	1,144,369	61,061	48,461	1,139,491	1,249,013

Summary of Programs for Target Audiences Audiences

Target Audience	# Programs Conducted
Extension Faculty	6
IFAS Administrators/Supervisors	1
Individuals/families	32
Professionals/practitioners	24
Youth	5

Summary of Programs for Primary

Target Audience	# Programs Conducted
4H (K-12)	1
After School Providers	10
Caregivers	15
Child Care Professionals	20
County Extension Directors	3
County Extension Faculty	7
County Extension Faculty with 3 years	1
County Extension Faculty with 4 - 7 years	1
County Extension Faculty with more than 7	1
Couples	11
District Extension Directors	1
Elder Care Providers	2
Elders	9
Families	19
Family Service Providers	17
Grandparents	14
Individuals	18
Parents, guardians, and caregivers	23
School teachers	10
State Extension Faculty with 3 years	1
State Extension Faculty with 4-	1
State Extension Faculty with 7 or more year	1
Volunteers	5
Young Children	7
Youth 11-13 (grades 6-8) years of age	4
Youth 14-18 (grades 9-12) years of age	3
Youth 8-10 (grades 3-5) years of age	1
Youth all ages (K-12)	4

Outcomes Accomplished by Focus Area

Type of Outcome: Attitude Change **Making**

Outcome	Evaluate	Change
Develop increased Self-Esteem / Self-Confidence	1,460	1,425

Type of Outcome: Behavior Change Made

Outcome	Evaluate	Making Change
Develop increased Self-Esteem / Self-Confidence	0	0
Effective Communication Skills	5,032	2,748
Family members learn strategies to prepare for family life changes.	136	136
Individuals develop skills needed to manage stress effectively.	1,480	1,248
Individuals learn knowledge/skills necessary for strong, healthy family relationships.	35,820	35,796
Participants will encourage curiosity, exploration and development of problem solving skills in a safe environment.	0	0
Participants will increase knowledge and skills of social and emotional development.	488	456
Participants will increase knowledge of various caregiving options.	76	76
Participants will increase their knowledge in subject matter and confidence in teaching.	0	0
Participants will learn how to develop safe/healthy learning environments for children/youth.	1,356	1,340
Participants will learn strategies to balance work and family.	3,528	2,280
Participants will learn teaching methods/preparation of learning materials.	540	480
Participants will learn what to expect from children/teens at different ages.	488	428
Participants will use positive techniques for guiding children's/teens' behavior.	1,908	1,736

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Develop increased Self-Esteem / Self-Confidence	3,855	1,905
Family members learn strategies to prepare for family life changes.	32	8
Participants will encourage curiosity, exploration and development of problem solving skills in a safe environment.	500	388
Participants will increase their knowledge in subject matter and confidence in teaching.	205	165
Participants will learn how to develop safe/healthy learning environments for children/youth.	844	688
Participants will use positive techniques for guiding children's/teens' behavior.	364	228

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Effective Communication Skills	1,388	1,216
Family members learn strategies to prepare for family life changes.	3,084	1,848
Individuals develop skills needed to manage stress effectively.	120	120
Individuals learn knowledge/skills necessary for strong, healthy family relationships.	7,268	5,148
Participants will encourage curiosity, exploration and development of problem solving skills in a safe environment.	716	664
Participants will increase knowledge and skills of social and emotional development.	2,244	1,512
Participants will increase their knowledge in subject matter and confidence in teaching.	1,350	1,305
Participants will learn a variety of strategies to help children/teens experience success.	1,100	540

Participants will learn how to develop safe/healthy learning environments for children/youth.	2,260	2,140
Participants will learn strategies to balance work and family.	436	380
Participants will learn teaching methods/preparation of learning materials.	216	180
Participants will learn what to expect from children/teens at different ages.	3,736	3,520
Participants will use positive techniques for guiding children's/teens' behavior.	468	452
Physical and cognitive changes that accompany aging	76	72

Type of Outcome: Skills Developed

Outcome	Evaluate	Making Change
Develop increased Self-Esteem / Self-Confidence	1,520	480
Effective Communication Skills	1,056	828
Family members learn strategies to prepare for family life changes.	128	112
Individuals develop skills needed to manage stress effectively.	4,524	2,700
Individuals learn knowledge/skills necessary for strong, healthy family relationships.	24	24
Participants will encourage curiosity, exploration and development of problem solving skills in a safe environment.	908	432
Participants will increase knowledge and skills of social and emotional development.	352	224
Participants will increase their knowledge in subject matter and confidence in teaching.	320	320
Participants will learn a variety of strategies to help children/teens experience success.	208	200
Participants will learn how to develop safe/healthy learning environments for children/youth.	552	544
Participants will learn teaching methods/preparation of learning materials.	432	428
Participants will learn what to expect from children/teens at different ages.	124	120
Participants will use positive techniques for guiding children's/teens' behavior.	780	664
Physical and cognitive changes that accompany aging	56	52

Success Stories for Planned Program 5

Source of funds: Smith-Lever
Scope: integrated, multistate, state

States Involved: To assist individuals and families to achieve economic well-being and life quality
AL, AZ, CA, CO, DC, FL, GA, HI, IA, ID, KY, LA, MN, MS, NC, NE, NJ, OH, OK, OR, SC, TN, TX, VA, WA, WI, WY

Planned Program 6: To achieve economic prosperity and community vitality in Florida's urban and rural areas

Long Term
National Goal: 5

KEY THEMES: Agricultural Financial Management, Community Development, Consumer Management, Estate Planning, Family Resource Management, Farm Safety, Fire Safety, Home Safety, Home-based Business Education, Impact of Change on Rural Communities, Jobs/Employment, Leadership Training and Development,

Literacy, Promoting Business Programs, Promoting Housing Programs, Tourism, Workforce Preparation – Youth and Adult, Workforce Safety, Youth Development/4-H, Youth Farm Safety

Statement of Issue

There are hundreds of municipalities in Florida, ranging from Islandia with 5 residents to the Greater Miami area with well over one million. Each Florida community has its own history and special flavor, as well as plans and hopes. The citizens of any community have the goal of working together to improve the quality of their lives and increase their opportunities.

For communities to grow, they must have the active interest and involvement of citizens in the form of a rich civic life. In this way, citizens come together to discuss and debate the needs and directions for their community. Then, once the decisions are made, citizens must come together to make and execute their plans. Another requirement for growth and opportunity is a robust economy. In Florida, a significant basis for such an economy is the natural environment, in terms of natural resources and natural beauty. Together, these account for much of Florida's overall economy in the forms of tourism, industry, recreation and agriculture. Most communities in Florida are looking to one or more of these areas as sources of economic growth.

As much as citizens and leaders might desire to have vibrant, cooperative communities, the skills needed to achieve this must be learned. Communities need guidance and expertise. They need support and information.

Hanging over all plans and achievements, however, is the possibility of disaster. In the last ten years or so, Florida has sustained major natural disasters, including devastating hurricanes and drought. These disasters have challenged --- and in one case, leveled --- communities. A hurricane or tornado can cause irreparable damage to a community, and a severe drought can change the economic welfare of an entire region.

The past two years have made all Floridians aware of other threats to the stability of our communities. Every community must now have some response ready in case of an intentional attack. These attacks can take many forms, including bombings and the introduction of disease agents.

Central to the life of our communities are the lives of their citizens, and that means working for their safety in the everyday hazards they face in their homes and workplaces. Florida's natural environment and large agricultural sector expose Florida citizens to a wide range of personal hazards or the possibility of creating hazards for others. As concerned as we are about large-scale emergencies, Floridians are much more likely to face death or injury through equipment or situations they encounter everyday.

Whatever our communities are confronted with, Extension must be ready to play its role. Through its reputation for community involvement and quality information, Extension has special capabilities that can assist communities in valuable ways during good times and bad.
Planned Program 6 has three focus areas:

1. Community Preparedness
2. Economic development and community services and infrastructure
3. Safety for agricultural operations and equipment

Focus Area 1: Community Preparedness
Summary of Topics Addressed

Topic	# Programs Conducted
Agricultural Awareness and Literacy	2
Preparedness	8
Recovery	6

Security	1
Special Disaster Topics	7
Survival	6

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
56	55	72	12,410	13,793	31,063	607	29,718	28,282	0	58,000

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	11	27	118	0	61	99	0	160
Email	0	0	12	24	173	72	86	64	135	285
Office Visit	0	0	20	22	568	0	50	49	514	613
Radio/TV	0	0	0	0	0	0	0	0	0	0
Telephone	0	0	23	61	647	1,136	577	368	927	1,872
Web Site	0	0	0	0	0	3,000	0	0	3,000	3,000
Total all Contacts	0	0	66	134	1,506	4,208	774	580	4,576	5,930

Summary of Programs for Target Audiences Audiences

Target Audience	# Programs Conducted
Agriculturists	2
Employees	2
Extension Faculty	3
Homeowners/Residents	8
IFAS Administrators/Supervisors	3
Special Populations	4

Summary of Programs for Primary

Target Audience	# Programs Conducted
4H (K-12)	3
4H Foundation	1
4H Volunteers	2
Adults/Families	7
Coastal Residents	3
County Extension Faculty	3
Disabled	2
Elders	3
Non-English Speakers	2
Producers (Livestock)	2
Workers/Laborers	2

Outcomes Accomplished by Focus Area

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Adults aware of location of nuclear power plants.	0	0
Agricultural Producers aware of sources of appropriate disaster preparedness information.	232	208
Workers aware of sources of mental health support in the event of disaster.	38	38

Focus Area 2: Economic development and community services and infrastructure

Summary of Topics Addressed

Topic	# Programs Conducted
Agricultural Awareness and Literacy	14

Community Decision Making	18
Economic Development	16
Growth Management	12
Leadership	9
Public Policy	12

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
161	1	53	1,104	1,935	13,125		9,204	7,030		16,219

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	298	1,076	230	142	832	784	142	1,758
Email	0	0	423	171	318	101,850	50,483	50,505	1,789	102,777
Office Visit	0	0	577	81	1,589	134	1,125	1,139	131	2,395
Radio/TV	0	0	0	0	0	468,000	125,000	125,000	218,000	468,000
Telephone	0	0	1,145	964	1,432	26,939	18,060	10,712	1,744	30,516
Web Site	0	0	0	0	0	158,559	79,000	77,000	2,559	158,559
Total all Contacts	0	0	2,443	2,292	3,569	755,624	274,500	265,140	224,365	764,005

Summary of Programs for Target Audiences
Audiences

Target Audience	# Programs Conducted
Businesses	12
Extension Faculty	6
Government Agencies	19
Non-Governmental Organizations	21
Organizations	15
Quasi-governmental Organizations	14

Summary of Programs for Primary

Target Audience	# Programs Conducted
County Extension Directors	5
County Extension Faculty	6
County Government	17
District Extension Directors	6
Government Agencies	13
Home-based businesses	7
Housing Authorities	5
Minority Businesses	6
Organizations -- Chambers of Commerce	16
Organizations -- Civic	15
Organizations -- Economic Development	17
Organizations -- Non-Profit	15
Regional Agencies	10
Small businesses	12
State Extension Faculty	5
Tourism Development Councils	6

Outcomes Accomplished by Focus Area

Type of Outcome: Best Practices Followed

Outcome	Evaluate	Making Change
Community to develop in more efficient manner	40	48
Implementation of smart business planning principles	324	324
Implementation of smart growth principles	422	292
Implementation of smart marketing principles	44	44

number of communities initiating a strategic planning process	162	162
number of employees added	126	80
number of local leaders trained	74	48
number of people trained in new business start-ups	124	124

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Appraising people and performance	72	72
Develop Communication Skills.	72	72
Develop Decision-Making, Problem-Solving and Critical Thinking Skills	72	72
Develop Leadership Skills	72	72
Disciplining and Counseling	72	72
Number of employees learning principles of working in teams	32	32
Teamwork and cooperation	108	108
Time management skills.	72	72

Type of Outcome: Technology Adopted

Outcome	Evaluate	Making Change
Implementation of smart growth principles	N/A	N/A

Focus Area 3: Safety for agricultural operations and equipment

Summary of Topics Addressed

Topic	# Programs Conducted
Agricultural Awareness and Literacy	1
Child Safety and Health	2
General Safety	6
Safety	6

Group Attendance Summary for Focus Area

Activities	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispani	White	Unk	Female	Male	Unk	Total
172	0	4	1,812	12,393	1,367	0	3,470	12,106	0	15,576

Clientele Contacts Summary for Focus Area

	Ethnicity						Gender			
	AI / AK	Asian	Black	Hispanic	White	Unk	Female	Male	Unk	Total
Client Visit	0	0	15	813	478	0	602	704	0	1,306
Email	0	0	0	0	0	49	0	0	49	49
Office Visit	11	11	40	69	460	0	216	364	0	580
Radio/TV	0	0	0	0	0	2	0	0	2	2
Telephone	65	65	39	226	664	548	395	634	548	1,577
Total all Contacts	76	76	94	1,108	1,602	599	1,213	1,702	599	3,514

Summary of Programs for Target Audiences Audiences

Target Audience	# Programs Conducted
Extension Faculty	2
Medical Personnel	2
Non-farm Residents	2

Summary of Programs for Primary

Target Audience	# Programs Conducted
County Extension Faculty	2
Emergency/Rescue/Medical Workers	2
Employers/Managers	4

Operations (Large-scale)	6	Farm Families	3
Operations (Small-scale)	4	Homeowners	2
		Producers (Crops)	2
		Producers (Livestock)	2
		Producers (Poultry)	1
		Small Farms	3
		Workers/Laborers	6
		Young Children	2

Outcomes Accomplished by Focus Area

Type of Outcome: Knowledge Gain

Outcome	Evaluate	Making Change
Children aware of safe procedures for working with livestock.	372	372
Children aware of the 'no extra riders' rule.	372	372
Children aware of the risks associated with handling chemicals.	372	372
Crop Producers understand appropriate safety measures to protect worker health.	40	40
Crop Producers understand the risks of tractor operation and the means of prevention.	920	920
Crop Producers understand vehicle dangers in agricultural operations.	70	70
Emergency/ Rescue /Medical Workers aware of agricultural exposures.	120	80
Farm Families aware of basic first-aid and emergency response procedures.	2,000	2,000
Farm Families aware of resources to create safety training programs.	10,400	10,400

Success Stories for Planned Program 6

Source of funds: Smith-Lever
Scope: integrated, multistate, state

States Involved:. To achieve economic prosperity and community vitality in Florida's urban and rural areas AL, CA, GA, MD, VA

VII. STAKEHOLDER INPUT PROCESS

Florida's Plan for Stakeholder Input Requirements for Recipients of Agricultural Research, Education, and Extension Formula Funds

Stakeholders
Guidelines
For
The University of Florida and Florida A&M University

Actions taken to encourage stakeholder input:
The University of Florida and Florida A&M University have established a process for "receiving input from persons who conduct or use agriculture research, extension, or education." These stakeholder processes include, but are not limited to, the following:

- UF/IFAS Extension 4 year Strategic Plan (completed in March 2004)
- FAMU/CESTA long-term strategic Plan (completed in 2004)
- Florida County Extension Advisory Committees
- Florida Ag Council, Inc.
- Departmental Advisory Committee and the Research and Education Center Advisory Committee
- Commodity Advisory Committees
- Florida Agricultural Industry Review
- Industry Ag Summits
- Meet with School of Forest Resources (SFRC) External Advisory Board 2x per year (composed of 30 industry, agency, NGO and private consultants)
- Serve on the advisory boards of Florida Forestry Association and Division of Forestry
- Maintain an active dialogue with forestry and natural resource alumni
- Prepare and regularly revise a Strategic Plan for the School of Forest Resources including a survey of more than 300 stakeholders

Brief description and process used to identify individuals and collect input

UF/IFAS Extension's strategic, long range planning process for FY 2004-2008 was a year long endeavor to evaluate, review and determine future direction to better carry out Extension's mission in support of Florida food, agricultural, natural and human resources. This initial process was accomplished through a grass roots approach in which advisory groups, representatives for the underrepresented and underserved populations, local government officials, commodity interests (both private and public), and the general citizenry were invited to attend local meetings in all 67 counties. Participants were asked to provide suggestions and make needs assessments. These county assessments were presented to Extension administrators at regional meetings conducted around the state.

Scientists and experts at UF/IFAS who research trends and major determinants of change in Florida's agricultural, human and natural resource subsectors were also asked for input into the process as well as some state and national commodity organizations. A total of 800 needs were identified state-wide (some were duplications and helped to identify trends). Information was then compiled and analyzed. Results were shared with teaching and research faculty as part of a close collaboration among the three units as a

resource for determining UF/IFAS research and extension imperatives for the future including immediate, short-term, and long term critical need areas.

Based on stakeholder input and an external review (Appendix F) held in February 2003, seven state goals (Appendix G)(six of which are included in the AREERA) were identified and announced by interim Extension Dean, Larry Arrington. The state goals are:

1. To Enhance and Maintain Agriculture.
2. To Maintain and Enhance Florida's Environment
3. To Develop Responsible and Productive Youth Through 4-H and Other Youth Programs
4. To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow
5. To Assist Individuals and Families Achieve Economic Well-Being and Life Quality
6. To Achieve Economic Prosperity and Community Vitality in Florida's Urban and Rural Communities
7. To Promote Professional Development Activities Designed to Enhance Organizational Efficiency and Effectiveness

For additional information on the Florida long range planning process and the Goal and Focus reorganizational structure go to http://pdec.ifas.ufl.edu.

FAMU/CESTA initated a long-term strategic planning project. Over 125 internal and external stakeholders provided their input through structured questionnaires. The survey revealed FAMU is on target in their 1890 programs and suggested several new areas that need attention:

1. Biomass/Biofuels
2. Nanotechnology in Agriculture
3. Obesity
4. Product development

These will be reported in AREERA as action teams under the state-wide focus areas presently under development by Florida Extension (1862/1890)

The Florida County Extension Advisory Committees provides direction for Extension education programs for both the University of Florida and Florida A &M University on a continual basis. Active advisory committees exist in all of Florida's 67 counties, usually at both the overall and program area levels. The committees serve as a vehicle for local citizens to participate in, influence and provide support to the planning, implementation and evaluation of Extension education programs, and the accountability for those programs. The composition of the committees consists primarily of positional and reputational leaders representing the areas of agriculture, agribusiness, natural resources, family and consumer sciences, 4-H youth, and community development. Special attention is given to the representatives of the target populations, including race and socio-economic level. Extension advisory committees are strongly believed to result in increased accuracy in identification of clientele-perceived needs, more effective decisions on program priorities and methods, and more rapid and accurate communication of program efforts and clientele feedback on both program impact and need for education and research. This committee format serves as a vehicle for local residents to participate in, influence and provide support to the planning and implementation of the Extension Education Programs.

Departmental Advisory Committee and the Research and Education Center Advisory Committee are developed in the same manner and have the same function as the county Extension Advisory committees.

Florida Ag Council, Inc. is a self-nominating body comprised of over 100 organizations. A 12-member board directs it. Its purpose is to increase the accuracy in the identification of clientele-perceived needs and to assist in the decision making process relating to research, teaching and Extension priorities.

Commodity Advisory Committees are various advisory groups with special emphasis on important program areas such as Florida A&M Universities program FL 261 Small Animal and Small-scale Farm Profitability and Sustainability in Florida- 1890. Of primary importance in identifying critical need areas is their Goat Program Advisory Council. Although commodity oriented, this type of advisory committee is still developed and functions using the same standards as the county advisory committees.

Florida Agricultural Industry Review(FAIR) a report on the University of Florida Institute of Food and Agricultural Sciences to the Florida Farm Bureau Federation . The purpose of this report was to provide input from agricultural industry to the University of Florida, Institute of Food and Agricultural Sciences (IFAS) and state policy makers on the structure and future of UF/IFAS. The recommendations and timelines given in this report center primarily in the agricultural area and was designed "to move IFAS into the top five agriculturally focused land grant institutions nationally.

Ag Industry Summits Report is presently being prepared from four industry led meetings held across the state (2004) which identified AG industry needs for IFAS research, teaching and extension. The final report is presently being compiled for release.

VIII. PEER AND MERIT REVIEW GUIDELINES

Scientific Peer and Merit Review Guidelines for
Research Project and Extension Program Proposals at
The University Of Florida and Florida A&M University

Intention: This document sets out performance standards and operational guidelines for the Florida Land Grant Universities. The intention of the document is to facilitate both Universities and all integrated, multi-institutional, and multi-state activities in complying with the provisions of the federal Agricultural Research, Extension, and Education Reform Act of 1998. Adoption of these standards and guidelines will be primarily accomplished by adoption-by-reference in the Florida Plan of Work.

Definitions: *Scientific Peer Review* of an individual research project is defined as the evaluation of the conceptual and technical soundness of the intended activity by individuals qualified by their status in the same discipline, or closely related field to judge the worthiness of the proposal. Merit review process of an Extension focus team area is defined as the evaluation of the quality and relevance to program goals and the focus team's level of success in meeting the intended objectives and the anticipated outcomes. Merit Reviewers will also be qualified by their status in the same discipline, or closely related field to judge the worthiness of the program.

The topics covered by this document pertain to research projects and extension programs (focus areas) that are to be sanctioned and funded as part of the federal-state partnership in agriculture research and extension. These standards and guidelines do not apply to proposed research projects and extension programs that are subject to peer review by competitive grant agencies, peer review of extension and research publications. Thus, all research projects and extension programs sponsored by Florida Land Grant Colleges will have been formally merit and peer reviewed, before the expenditure of any federal funds.

Process: Prior to the initiation of any research project or extension program that will be wholly, or in part, funded by federal formula funding, the designated review coordinator (or, in the case of some multi-institutional, regional or multi-state projects, the administrative advisor) will call for a peer review of the proposed research or extension project. A minimum of three peer scientists (i.e., individuals qualified by their status in the same discipline, or a closely related field of science) will be selected to read and provide written comments to the appropriate administrator on the proposed project. The focus goal team made up of focus team leaders will read and provide written comments to the appropriate administrator on proposed programs (focus areas)..

Terms of Reference: The terms of reference for the reviewers will focus their attention on questions of the quality of the proposed science, technical feasibility of the research or extension program, the validity of the approach, and the likelihood for completing the stated objectives. Other equally important comments will include relevance to the state's priorities, the degree of integration between extension and research (as appropriate), responsiveness to stakeholders identified critical need areas, and the accuracy of any claims for multi-disciplinary, multi-institutional and multi-state collaboration.

Responsibility: All Merit Review activities for proposed Extension programs will be the responsibility of the Dean of Extension or his/her designee . All Peer Review activities for proposed research are the responsibility of the Dean for Research or his/her designee.

Appointment of Reviewers: Peer and Merit reviewers may be selected from the same campus or from another institution or organization at the discretion of the research and/or Extension dean(s), or by their delegated authority. Consideration will be given to the expenses associated with the reviewing individual proposal in the selection of reviewers. Additional consideration will be given to appointing reviewers who are without any apparent conflicts of interest and who are without personal or professional bias. Consideration may also be given in selecting reviewers that can protect confidential business information. The anonymity of the reviewers will not be preserved except in very special circumstances.

Documentation: Reviewers will be asked to present their findings in either paper or electronic format, and records of the reviewers comments will be preserved for the life of the project, or for a period of three years in the event that a project is not initiated. Document storage of all materials related to the Peer and Merit Review will be paper and/or electronic.

Research and Extension projects and programs not covered: Projects and Programs funded by competitively awarded grants, federal contract research projects, and federal cooperative agreements are not subject to these provisions, as they would be peered reviewed under other authorities.

Performance Standards: Peer review of proposed projects, and merit review of Extension programs is expected to provide the following performance outcomes:

Research

- Increase the quality of science funded by the federal-state partnership
- better assure relevance to institutional priorities and mission
- provide more responsiveness to stakeholder needs including the underserved and under-represented populations,
- and identify more opportunities to partner with other states, regions, federal research agencies, and Extension counterparts.

Extension

- Provide more responsiveness to stakeholder (including the underserved and under-represented) identified critical need issues
- Better assure relevance to institutional priorities and mission
- Increase the quality of programs, events and activities funded by the federal-state partnership, and
- Identify more opportunities to partner with other institutions, regions, states, and research counterparts

Performance outcomes from Merit and Peer Review

Performance outcomes from the merit reviews will be monitored by the Programs Development and Evaluation Center (PDEC) through the annual accountability process. Scientific peer reviews will be monitored by the Research Administration Office.

Adjustments to this merit and scientific peer review process will be made as needed.

a. EVALUATION FORM FOR MERIT REVIEW

Extension Merit Review of Florida Goal Teams
Goal Number:
Goal Title:
Goal Leaders:
Focus Team Title:
Reviewer(s): _____Accept _____Accept with minor revision(s) (Explain required revisions) _____Accept with major revision(s)(Explain required revisions) _____Reject (Explain your reasons for rejection).

For each statement below, please indicate your rating of how well the following statements have been written by the Focus Team (check one column for each statement)

	Likert Scale					
The Situational Statement and Rationale…	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Articulates the importance to agriculture, human and natural resources, rural and urban life, and/or consumer concerns and science						
Relates to current priorities as identified by Florida stakeholders (long range planning, advisory committees, surveys etc.)						
Describes the situation						

Demonstrates the need for integration with research (and Teaching as appropriate)						
Explains the benefits of a multi-state, multi-institutional approach (if appropriate)						

Outcomes: The Focus Teams…	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
State clear, concise, measurable and focused clientele outcomes						
Relate outcomes to situation statements						

Audience: The Focus Teams…	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Clearly identify the audience(s) that need(s) to be targeted						
Include underserved and underrepresented individuals and population segments						

Educational Activities and Impacts: The Focus Teams…	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Lists appropriate methods to reasonably expect attainment of the outcome						
Describes potential impacts for each focus area						

Evaluation: The Focus Team…	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Clearly states its tools and approaches to be used (e.g., pre- and post- tests, survery,, etc.) and the expected results (e.g., increase knowledge, modified behavior, impact, etc.)						
Includes appropriate impact statements						

i. EXAMPLE OF 2004 MERIT REVIEW.

All goal areas were evaluated and are on file.

- **Evaluation Form for Merit Review**

Extension Merit Review of Florida Goal Teams
Goal Number: 1
Goal Title: To enhance and maintain agricultural and food systems
Goal Leaders: names on file
Focus Team Title: all focus teams evaluated within the goal area
Reviewer(s): names on file __X__Accept _____Accept with minor revision(s) (Explain required revisions) _____Accept with major revision(s)(Explain required revisions) _____Reject (Explain your reasons for rejection).

Regarding the Goal 1 Situation Statement:
Four major challenges are listed. Of these, "Economic Well-being" cites Trade Agreements as one of four sub-issues. There are other aspects of government policy related to this that also might be important. Did the Team consider government policies concerning price support programs, immigration/guest worker issues or regulation of technologies such as GMOs?

For each statement below, please indicate your rating of how well the following statements have been written by the Focus Team (check one column for each statement)

Likert Scale

The Situational Statement and Rationale…	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Articulates the importance to agriculture, human and natural resources, rural and urban life, and/or consumer concerns and science					X	
Relates to current priorities as identified by Florida stakeholders (long range planning, advisory committees, surveys etc.)				X		
Describes the situation						X
Demonstrates the need for integration with research (and Teaching as appropriate)			X			
Explains the benefits of a multi-state, multi-institutional approach (if appropriate)				X		

Outcomes: The Focus Teams…	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
State clear, concise, measurable and focused clientele outcomes					X	
Relate outcomes to situation statements					X	

Audience: The Focus Teams…	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Clearly identify the audience(s) that need(s) to be targeted					X	
Include underserved and underrepresented individuals and population segments				X		

Educational Activities and Impacts: The Focus Teams…	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Lists appropriate methods to reasonably expect attainment of the outcome					X	
Describes potential impacts for each focus area					X	

Evaluation: The Focus Team…	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Clearly states its tools and approaches to be used (e.g., pre- and post- tests, survery,, etc.) and the expected results (e.g., increase knowledge, modified behavior, impact, etc.)				X		
Includes appropriate impact statements				X		

b. EVALUATION FORM FOR PEER REVIEW

Dr. William F. Brown
FAES\CRIS Project Review Chair

December 12, 2003

Dear ___

Thank you for agreeing to review the enclosed FAES/CRIS Project proposal by: _____

Your complete and thorough review of this proposal is of fundamental importance to the research efforts of IFAS and insures the continuation of the high-quality IFAS statewide research program.

Please evaluate the proposal, considering the following points:

1) Does the project outline follow the format delineated in IMM 6C1-6.120-3 "IFAS: Research Planning" (excerpt enclosed; document located at: http://research.ifas.ufl.edu/projects/prepinstructions.html)

2) Is the work relevant to critical emerging issues in agriculture, rural life, consumers, and science?

3) Does the proposal clearly state the anticipated outcomes of the work, and do these outcomes benefit the scientific, extension, and educational components of IFAS?

4) Do the experimental design and methodology clearly address the stated objectives of the study?

5) In your view, does the project show evidence of high scientific quality? Does this project duplicate research being done through other projects?

6) Does the proposal provide opportunities for collaborative interactions with other individuals or units to maximize efforts and resources?

Please make your comments on a separate sheet, and provide an over-all summary of the primary changes you believe should be made before final approval. You may also mark appropriate changes in the body of the proposal. If you choose, you may sign your name to the review or remain anonymous.

Please return the copy of the proposal and an original and 2 copies of your written review and comments to me. Again, I would appreciate the return of your review by: **January 16, 2004.**
Thank you for your assistance in this important matter.

Sincerely,

William F. Brown

! Office of the Dean for Research !P. O. Box 110200 ! Gainesville, FL 32611
! Phone: (352) 392-1784 ! FAX: (325) 392-4965 ! e-mail: wfbrown@mail.ifas.ufl.edu

Excerpt From "Instructions For The Preparation Of Project Statements"
UF/IFAS Internal Management Memorandum 6C1_6.120_3

The Project Statement should contain the following components:

I. Objectives: A clear, complete and logically arranged statement(s) of the specific objectives of the research to be conducted. The objective(s) should adequately cover all the work outlined in the procedures.

II. Justification: A short statement of the problem giving its importance in science, agriculture, environment, rural life and consumer concerns. The following questions should be addressed:

A. What is the importance of the problem to agriculture and natural resources and urban or rural life of the state or region? This should insofar as possible be answered in terms of acres, tons, people, cattle, plants, dollars, or other specific items. When possible, mention the dollar value of the industry. References in support of these items should be cited.

B. What are the benefits which may result from the proposed research? Express this is terms of new varieties, reduced labor costs, increased production, larger net returns, or other appropriate specific results.

C. What will be the dollar value of losses caused by the problem? Acres, tons, or other measures may be used if a dollar evaluation cannot be made. The above information is important whether the research in question is applied or basic in nature. The question may be more difficult to answer for basic research, but the importance of the problem and the reasons for undertaking the work should be clearly pointed out in either case.

III. Related Current and Previous Work

1. What has been done? (Literature Review) Should be a brief summary covering pertinent research on the problem. References should be included indicating what was found and its significance.

2. What needs to be done? (Hypothesis, rationale) Should be a summary statement placing emphasis on the research currently needed in this area of work. This paragraph should also contain an outlook statement, i.e., the PIs appraisal of what may be accomplished by this project.

IV. Procedures: A statement of the essential working plans and methods to be used in attaining each of the stated objectives. There should be a numbered statement of procedures to correspond with each numbered objective and follow the same order. Whenever possible it should be presented in enough detail to serve as a guide for project PIs and to enable the reviewer and other readers to obtain a clear concept of the research to be done. For each objective, one or more experiments, or examples of the types of experiments) should be described that will seek to fulfill that objective.

Literature Cited: Literature references within the text should be given by author and year. Full citation of these references should be included in a "Literature Cited" section at the end of the Statement with the format: author(s), year, title, publication, volume, and pages.

IX. MULTI-STATE AND INTEGRATED ACTIVITES SUMMARY

In 2004, Florida IFAS expended over 25% of Smith-Lever and Hatch funding in extension integrated and multi-state programs and research integrated. After five years of working on an online accountability system for IFAS faculty in 2004 a dynamic software was completed that allows the Florida land grant colleges to capture all state and county activities in research (1862), teaching (1862) and extension (1890, 1862). Florida is able to do a much better job now of collecting needed information to show integration between research and extension and also multi-state activities that are based on federal funding.

Florida Extension continues to look for better ways to expand integration and multi-state activities:

- Through the extension strategic plan Florida has focused programs in a way that allows state aggregation of data. Through this focus of planned programs Florida is able to address the critical issues issues of strategic importance especially those identified by stakeholders. We are able to see that we have met these issues.
- Through the faculty accountability reporting system (unifas) we are able to obtained state aggregated numbers on clientele which allows us to observe whether or not we have addressed the needs of under-served and under-represented populations in Florida. The resulting breakdown by minority and gender and outcomes from programs addressing these needs show that we have been successful
- As part of the strategic process research and extension are working closer together in a more formal manner and reporting these collaborations in their accountability reports.
- Extension districts along state lines have collaborated with Georgia and Alabama to develop annual tri-state workshops over the past four years that have increase the level of multi-state activity and reduced duplication of efforts.
- There has been a marked increase in state faculty involved in multi-state activities developed through needs assessments identified at regional and national conferences.
- Communication through websites and emails have increased interest, understanding and involvement in integrated and multi-state programs.
- Research and extension administration are supportive and actively involved in the effort.
- State and county faculty are supportive and actively involved in developing stronger collaborations for the betterment of the land grant university.
- All of these bullets listed above show an improvement in program effectiveness and efficiency.

In summary: Florida Extension and Research continues to examine ways that will allow us to more clearly design, implement and report multi-state and integrated activities. Florida administration, faculty and staff are fully behind the process as we strive to meet the needs of our constituents.

X. MULTI-STATE ACTIVITIES

U.S. Department of Agriculture
Cooperative Research, Education, and Extension Service
Multi-State Extension Activities

U.S. Department of Agriculture Cooperative Research, Education, and Extension Service Multi-State Extension Activites

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
2004 Multistate Extension Activities and Integrated Activities

Institutio University of Florida

State: Florida

Check X Multistate Extension Activitives
Intgrated Activities (Hatch Act Funds)
Integrated Activities (Smith-Lever Act Funds

Title of Program	Smith-Lever Expenditures
2004 Beef Cattle Short Course	$228
2004 Beef Cattle Short Course	$4,402
2004 Improving Urban Horticultural Practices	$10,937
2004 NACAA Annual Meeting and Professional Improvement Conference	$3,539
2004 NACAA Annual Meeting and Professional Improvement Conference	$3,729
2004 NACAA Annual Meeting and Professional Improvement Conference	$1,389
2004 NACAA Annual Meeting and Professional Improvement Conference	$243
2004 NACAA Annual Meeting and Professional Improvement Conference	$564
2004 NACAA Annual Meeting and Professional Improvement Conference	$479
2004 NACAA Annual Meeting and Professional Improvement Conference	$1,988
2004 NACAA Annual Meeting and Professional Improvement Conference	$3,529
2004 NACAA Annual Meeting and Professional Improvement Conference	$586
2005 Beef Cattle Short Course	$2,935
4H and youth programs	$86,948
4-H Life Skills in Escambia County	$9,213
4-H Natural Resources	$421
4-H Volunteer Development in Escambia County	$2,764
Affordable Housing	$9,033
Agroforestry	$4,493
Agroforestry	$5,542
Agronomic Crop Production in Santa Rosa County (Cotton Emphasis), 2004	$2,626
Agronomic Crop Sustainability	$43,538
Animal Waste Composting	$84
Animal Waste Composting	$6,256
BAY4H-01 Lifeskill Development	$1,681
Best Management Practices for Home Landscapes	$3,460
Building the Extension Team in Suwannee County	$9,537
Certified Crop Adviser Training	$3,971

Certified Crop Adviser Training	$4,773
Citrus Irrigation Management & Freeze Protection	$64,639
CMP 301 Jackson Livestock Extension Educational Program	$1,269
CMP 301 Jackson Livestock Extension Educational Program	$36
CMP 301 Jackson Livestock Extension Educational Program	$1,096
CMP 301 Jackson Livestock Extension Educational Program	$4,154
Commercial Blueberry Production	$17,791
Commercial Blueberry Production	$6,680
Commercial Livestock and Small Farms	$84
Commercial Vegetable and Fruit Production in Hillsborough County	$10,594
Coordinate the extension program development and delivery for county extension faculty of the Northwest Extension District	$26,769
Cotton Production - Quad County	$6,900
Creating and Maintaining Attractive Sustainable Landscapes	$1,961
CSREES Southern Regional Water Quality Program	$11,152
CSREES Southern Regional Water Quality Program	$9,547
CSREES Southern Regional Water Quality Program	$8,209
CSREES Southern Regional Water Quality Program	$6,323
CSREES Southern Regional Water Quality Program	$7,942
Dairy business management	$28,616
Dairy business management	$204
Dairy business management	$684
Dairy Production in Okeechobee County	$1,654
DDIS / NPDN / SPDN	$1,300
DDIS / NPDN / SPDN	$2,796
DDIS / NPDN / SPDN	$75
DDIS / NPDN / SPDN	$608
DDIS / NPDN / SPDN	$137
DDIS / NPDN / SPDN	$4,433
DDIS / NPDN / SPDN	$36
Developing 4-H Military Partnerships with Air Force	$211
Developing 4-H Military Partnerships with Air Force	$2,130
Developing protocols for producing quality trees in the nursery	$14,717
Educating Through Mass Media	$1,223
Educational activities focused on optimizing cattle productivity and well-being in subtropical environments	$40,441
Enhancing Professionals' Ability to Serve Families	$14,284
Enhancing Team Performance of County Government	$31,410
Enhancing the productivity and business management of production nurseries in Miami-Dade County	$2,526
Environmental Education for Florida's Youth	$10,295
Environmental Education for Florida's Youth	$2,000
Escambia County Aquaculture 2004	$306
Escambia County Natural Resources 2004	$184
Escambia County Row and Forage Crops 2004	$1,287
Establishment and Maintenance of Sustainable Native Wildflower Plantings	$6,483
Establishment and Maintenance of Sustainable Native Wildflower Plantings	$1,760
Extension Leadership Forum	$2,013
Extension Leadership Forum	$61,708
Family and Child Development	$13,482
Family and Consumer Sciences (FCS)	$8,429
Family Resource Management	$9,737
Financial Management	$28,181
Financial Management	$13,456
Financial Management and Economic Well-Being	$71,441

Financial Management in Jackson County	$14,303
Fire in the Florida Ecosystem	$2,740
Florida Plant Diagnostic Network (Member of SPDN and NPDN)	$9,097
Food Safety and Quality in Bay County	$7,962
Food Safety and Quality in Bay County	$172
Food Safety and Quality in Florida	$21,080
Forest Stewardship Program	$2,861
Furthering Agricultural Economic Development in Hamilton County	$8,472
Generating economic information for the nursery and greenhouse industry.	$65,519
Genetic Issues in Hard Clam Aquaculture	$10,885
Hay & Forage Programming	$3,181
Hay & Forage Programming	$479
Hay & Forage Programming	$889
Hay & Forage Programming	$1,893
Health and Well-being in Suwannee	$7,336
Healthier Lifestyle Choices for Jackson County Residents	$8,990
Healthy Homes and Children Environmental Program	$19,872
Horticulture Professionals Okaloosa County 2004	$1,124
Horticulture Professionals Okaloosa/Walton County 2004	$227
Human Development, Pareanting and Strengthening Families	$10,271
Hurricane Recovery Efforts for the Clam Aquaculture Industry	$3,810
I.Enhancing Volunteer Development in Jefferson County	$721
Improving Family Resource Management	$2,388
Improving Livestock Production	$6,417
Improving Natural Resources Ethics, Safety, and Ecosystem Conservation	$2,353
Improving The Overall Health Of Dairy Operations	$3,565
Increasing Small Farmers Knowledge of Sustainable Alternative Agriculture Enterprises	$3,137
IPM for Mosquito Control	$1,015
IR-4, Minor Use Pesticide Registration Program	$7,379
Juice HACCP	$6,499
Life Skill Development	$12,320
Livestock Integration into Conservation Cropping Systems	$1,717
Management of Private Non-Industrial Forests in Walton, Holmes, Okaloosa Counties	$269
Managing a 4-H Program	$11,485
Managing the 4-H Program in Jackson County	$6,201
Marine Education for Youth and Adults	$13,111
Marketing FCS Program in County	$2,717
Medical & Veterinary Entomology for Public Health	$27,803
Medical & Veterinary Entomology for Public Health	$10,081
Medical & Veterinary Entomology for Public Health	$25,428
Medical & Veterinary Entomology for Public Health	$18,785
Multi-State Volunteer Development	$533
National Association of Extension 4-H Agents	$39,687
National Organic Standards Training	$22,127
National Organic Standards Training	$6,317
National Organic Standards Training	$823
National Organic Standards Training	$1,231
Native Forest Ecosystem Restoration and Management	$7,777
Native Forest Ecosystem Restoration and Management	$1,760
Natural Resource Management / Wildlife Habitat	$1,278
Natural Resource Management / Wildlife Habitat	$322
New Plants for Florida Residents	$3,625
New Plants for the Green Industry	$7,307
New Plants for the Green Industry	$19,034
Nutrition and Food Safety	$5,570
Nutrition and Health in Florida	$79,650

Nutrition, Food Safety and Health DeSoto County	$14,013
Oka III-1 Life Skills Development	$5,728
Oka III-1 Life Skills Development	$2,757
Okeechobee Master Gardener Program	$3,381
Organizing and Managing Volunteers	$8,238
Pasture and forage production and management in Okeechobee	$580
Peanut Production in Jackson County, 2004	$179
Peanut Production in Jackson County, 2004	$373
Peanut Production in Jackson County, 2004	$13,070
Pest and Disease Management in South Florida Vegetables	$1,466
Pesticide and Farm Safety Programs, Diagnostics	$3,469
Pesticide Use and Environmental Quality, 2004	$708
Pesticide, BMP, & WPS Training for Landscape Maintenance Professionals & Small Farmers	$882
Profitable Horticultural Production & Marketing in Santa Rosa County	$138
Profitable Horticultural Production & Marketing in Santa Rosa County	$3,337
Profitable Horticultural Production & Marketing in Santa Rosa County	$272
Program Planning and Evaluation for Family, Youth and Community Sciences	$36,830
Project Learning Tree	$4,315
Promoting Personal Health and Well-Being	$20,306
Regional Programming for the Commercial Landscape Industry	$7,478
Regional Programming for the Nursery/Greenhouse Industry	$3,399
Retail Food Safety and Quality	$10,252
Rural Tourism Initiative	$16,457
Safe Use of Pesticides	$500
Safe Use of Pesticides	$1,518
Small Farms	$178
Small Farms	$3,835
Small Farms	$86
Small Farms	$75
Small Farms	$143
Southern Region SARE Program	$3,627
Southern Region SARE Training Program	$3,627
State Agriculture Response Team	$4,163
State Agriculture Response Team	$803
State Agriculture Response Team	$1,217
Statewide Support for FYN	$4,305
Strengthening Families Through Education	$8,613
Strengthening Programs to Reach Diverse Audiences CYFERNet Grant Project	$34,272
Supporting Program Planning, Evaluation, and Accountability in Extension	$12,064
Sustainable Agricultural Production in Okaloosa County 2004	$8,324
Sustainable Agricultural Crop Production in Okaloosa County 2005	$569
Sustainable Agricultural Production in Santa Rosa County, 2004	$4,796
Sustainable Agriculture Production In Walton County	$5,910
Sustainable Agriculture Network	$3,627
Sustainable Agronomic Crop Production	$36
Sustainable Agronomic Crop Production	$959
Sustainable Cultural Practices and Postharvest Issues	$4,840
Sustainable Hard Clam Aquaculture Production	$5,805
Sustaining small farms by raising and marketing alternative crops and livestock	$179
Taylor County Farm Profitability	$6,399
Teaching Youth Life Skills Through 4-H Shooting Sports, Swine Project, and other Experiences	$5,882
Utilization and Conservation of Natural Resources in Okaloosa County 2004	$2,846
Vegetable Production	$704

Weed management in vegetable production	$30,269
Wildland-Urban Interface	$46,025
Wildland-Urban Interface	$4,470
Youth Animal Sciences Education	$7,229
Youth in Liberty County Gaining Life Skills through 4-H	$11,859
Youth Project Areas	$6,830
Total Multistate	$1,748,089

XI. RESEARCH INTEGRATED ACTIVITIES

U.S. Department of Agriculture
Cooperataive State Researach, Education and Extension Service
Integrated Research Activities

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
2004 Multistate Extension Activities and Integrated Activities

Institutio University of Florida

State: Florida

Check
- Multistate Extension Activitives
- X Intgrated Activities (Hatch Act Funds)
- Integrated Activities (Smith-Lever Act Funds

Project Number	Title of Program	Hatch Expenditures
ABE-04016	Development and Evaluation of Tmdl Planning and Assessment Tools and Processes	$175
APO-03609	Introduction And Evaluation Of Ornamental Plants	$1,902
APO-03875	Development Of New Potato Clones For Environmental And Economical Sustainability In The Northeast	$2,145
APO-04012	Biology and Management of Arthropod Pests of Vegetables	$59,400
BGL-04012	Biology and Management of Arthropod Pests of Vegetables	$44,712
BRA-03764	Strawberry Cultivar Development	$39,970
BRA-04012	Biology and Management of Arthropod Pests of Vegetables	$69,560
DOV-03586	The Epidemiology And Control Of Strawberry Diseases	$3,054
DOV-03764	Strawberry Cultivar Development	$39,970
ENH-03609	Introduction And Evaluation Of Ornamental Plants	$34,673
ENH-04069	Cultural Systems for Specialty Cut Flowers and Other New Ornamental Crops for Florida	$4,940
ENY-03694	Managing Plant-parasitic Nematodes in Sustainable Agriculture with Emphasis on Crop Resistance	$369
ENY-03723	Conservation and Laboratory Rearing of Butterflies	$25,871
ENY-03788	Development of Ecological Methods for Nematode Management	$15,946
ENY-04012-	Biology and Management of Arthropod Pests of Vegetables	$9,368

ENY-04012-	Biology and Management of Arthropod Pests of Vegetables	$9,250
ENY-04025	Chemical Ecology and Management of Insect Pests of Blueberry, Vaccinium spp., in Florida	$27,981
FOS-03764	Strawberry Cultivar Development	$6,485
FRE-03571	Dynamic Economic Analysis Of The Florida Citrus Industry	$751
FRE-03599	The Effect Of Farmland Boom/bust Cycles On The Rural Economy	$2,063
FTL-03607	Bionomics And Management Of Hemipterous Pests Of Woody Ornamental Plants And Turfgrasses In Florida	$26,524
FTL-03711	Turfgrass Fertility Management and Environmental Impact	$37,965
FTP-03700	Plant Growth Regulators To Enhance Profitability Of Fresh And Processed Florida Citrus	$27,810
FYC-03960	Enhancing Food Safety and Quality Through Technologies and Consumer Research	$1,860
HOM-03998	Sustainable Vegetable Production Systems for South Florida Based On Use of Cover Crops, Precision Irrigation and Chemical Soil Sterilants	$21,196
HOS-03559	Senescence Physiology And Deterioration In Harvested Tomato And Other	$1,068
IMM-03571	Dynamic Economic Analysis Of The Florida Citrus Industry	$9,782
IMM-04012	Biology and Management of Arthropod Pests of Vegetables	$5,340
JAY-03609	Introduction And Evaluation Of Ornamental Plants	$18,989
LAL-03571	Dynamic Economic Analysis Of The Florida Citrus Industry	$596
LAL-03788	Development of Ecological Methods for Nematode Management	$55,387
ONA-03726	Evaluation of Forage Germplasm and Forage Management Practices.	$10,561
PLP-03603	Enhancing The Sustainability Of Commercial Peanut Productionthrough Improved Disease Management	$11
QUN-03609	Introduction And Evaluation Of Ornamental Plants	$47,746
QUN-03854	Selection and Adaptation of Grass and Legume Species for Forage Production in the Southern Coastal Plain and Penisular Florida	$82,665
QUN-04012	Biology and Management of Arthropod Pests of Vegetables	$26,947
SWS-03711	Turfgrass Fertility Management and Environmental Impact	$22,002
	Total Research Integrated Expenditures	$795,034

XII. EXTENSION INTEGRATED ACTIVITIES

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
2004 Multistate Extension Activities and Integrated Activities

Institutio University of Florida

State: Florida

Check
- Multistate Extension Activitives
- Intgrated Activities (Hatch Act Funds)
- X Integrated Activities (Smith-Lever Act Funds

Faculty Member Conducting Program Adjei, Martin		**Smith-Lever Expenditures**
Title of Program	**Research**	$21,961
Forage Workers Tour	FLA-ONA-04210	
Pasture Pests Control -- RCREC-MBA-01	FLA-ONA-04210	
Winter Forage Program	FLA-ONA-04210	

Faculty Member Conducting Program Andersen, Peter		**Smith-Lever Expenditures**
Title of Program	**Research**	$7,309
Educate homeowners in Walton County on home horticulture and gardening through the Master Gardener Program and its volunteers.	FLA-MON-03238	
Home Horticulture	FLA-MON-03238	
Stone Fruit Production	FLA-MON-03238	
Sustainability assessment of fruit and nut crops in north Florida	FLA-MON-03238	

Faculty Member Conducting Program Arthington, John		**Smith-Lever Expenditures**
Title of Program	**Research**	$39,841
2004 Beef Cattle Short Course	FLA-ONA-	
2005 Beef Cattle Short Course	FLA-ONA-	
Central Florida Livestock Agent's Group	FLA-ONA-	
Educational activities focused on optimizing cattle productivity and well-being in subtropical environments	FLA-ONA-	
Forage Workers Tour	FLA-ONA-	
Livestock production	FLA-ONA-	
Small Farms Livestock Production Conference	FLA-ONA-	
Winter Forage Program	FLA-ONA-	

Faculty Member Conducting Program Blount, Ann Rachel Soffes		**Smith-Lever Expenditures**
Title of Program	**Research**	$21,728
Alternative Opportunties for Small & Part-time Farmers	FLA-AGR-	
CMP 301 Jackson Livestock Extension Educational Program	FLA-AGR-	
Hay & Forage Programming	FLA-AGR-	

NFREC Beef Cattle/Forage Field Day	FLA-AGR-
Sustainable Agricultural Production in Okaloosa County 2004	FLA-AGR-
Sustainable Agriculture Production In Walton County	FLA-AGR-
Testing	FLA-AGR-

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Boman, Brian

Title of Program	**Research**	$24,583
1. Water and Fertilizer Management in Vegetable Production in Manatee County	FLA-FTP-	
BMP Development and Implementation	FLA-FTP-	
BMPs Certification and Licensing	FLA-FTP-	
Certified Crop Adviser Training	FLA-FTP-	
Certified Crop Advisor Training, SWFREC, June, 2004	FLA-FTP-	
Editing the rewrite of SP169 "Nutrition of Florida Citrus Trees"	FLA-FTP-	
Fruits and Vegetables Focus Group (Fruits Team)	FLA-FTP-	
Hispanic Farm Safety Education	FLA-FTP-	
Matching Rootstocks to Soil and Site Factors to Improve Grove Profitability	FLA-FTP-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Buss, Eileen

Title of Program	**Research**	$17,244
Arthropod Galls of Florida. In-Service Training. 2004. With E. Buss and A. Hodges.	FLA-ENY-	
Ornamental and Turf Pest Control Manual SM7	FLA-ENY-	
Southeast Pest Management Conference, Lawn and Ornamentals	FLA-ENY-	
Supplementary Hands-On Practical Materials for IPM Distance Education for Landscape Maintenance Professionals	FLA-ENY-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Cabrera, Brian

Title of Program	**Research**	$6,530
Household and Structural Insect Diagnostics	FLA-FTL-	
School of Structural Fumigation	FLA-FTL-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Chambliss, Carrol

Title of Program	**Research**	$16,062
Central Florida Livestock Agent's Group	FLA-AGR-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Chen, Jianjun

Title of Program	**Research**	$7,201
Best Water and Nutrient Management Practices for Ornamental Foliage Plant Production	FLA-APO-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Chung, Kuang

Title of Program	**Research**	$13,216
Control of foliar fungal diseases of citrus	FLA-IMM-03949	
Development and implementation of pest diagnosis at CREC	FLA-IMM-03949	

Exotic Citrus Diseases in Florida	FLA-IMM-03949

Faculty Member Conducting Program		**Smith-Lever**
Cisar, John		**Expenditures**
Title of Program	**Research**	$8,477
Developments in Turfgrass Management and Water	FLA-FTL-	
Generating economic information for the nursery and greenhouse industry.	FLA-FTL-	
Urban Eccosystem Pesticide Management/Biorational Alternatives EHGJ-2	FLA-FTL-	
Urban Ecosystem/Plant Selection/Management EHGJ-1	FLA-FTL-	

Faculty Member Conducting Program		**Smith-Lever**
Crane, Jonathan		**Expenditures**
Title of Program	**Research**	$16,889
Development and Delivery of Canker Education to Diverse Audiences in Florida	FLA-HOM-	
Enhance Farm Productivity & Management (Miami-Dade)	FLA-HOM-	
Establishing Professionalism in the Commercial Green Industry	FLA-HOM-	
Fruits and Vegetables Focus Group (Fruits Team)	FLA-HOM-	
Industry Organizing – Assist producers organize for their mutual benefit	FLA-HOM-	
IR-4, Minor Use Pesticide Registration Program	FLA-HOM-	
Optimizing Fertilizer Management Practices for Crops in South Florida	FLA-HOM-	
Tropical Fruit Management	FLA-HOM-	
Tropical Fruit Selection/Management for Homeowners and Commercial Growers EHGJ-3	FLA-HOM-	
Tropical Fruit Selection/Management for Homeowners and Commercial Growers EHGJ-3A	FLA-HOM-	
Water conservation techniques to optimize water use by agricultural crops grown in very coarse calcareous soils	FLA-HOM-	

Faculty Member Conducting Program		**Smith-Lever**
Crow, William		**Expenditures**
Title of Program	**Research**	$16,795
Nematode Assay Lab	FLA-ENY-	
Nematology training for agricultural commodity groups	FLA-ENY-	
Nematology training for residential landscapes	FLA-ENY-	
Nematology training for the landscape industry	FLA-ENY-	
Ornamental and Turf Pest Control Manual SM7	FLA-ENY-	
Supplementary Hands-On Practical Materials for IPM Distance Education for Landscape Maintenance Professionals	FLA-ENY-	

Faculty Member Conducting Program		**Smith-Lever**
Cuda, James		**Expenditures**
Title of Program	**Research**	$14,516
Establishing Professionalism in the Commercial Green Industry	FLA-ENY-	
Management and Ecology of Invasive Aquatic, Wetland and Terrestrial Plants in Florida	FLA-ENY-	
Supplementary Hands-On Practical Materials for IPM Distance Education for Landscape Maintenance Professionals	FLA-ENY-	

University of Florida IFAS Extension Invasives Summit	FLA-ENY-	

Faculty Member Conducting Program		**Smith-Lever**
Deng, Zhanao		**Expenditures**
Title of Program	**Research**	$6,789
Evaluation and selection of new floriculture crop varieties for Florida	FLA-APO-	

Faculty Member Conducting Program		**Smith-Lever**
Duval, John		**Expenditures**
Title of Program	**Research**	$6,612
1. Water and Fertilizer Management in Vegetable Production in Manatee County	FLA-DOV-	
Improved cultural management practices for strawberry production in Florida	FLA-DOV-	

Faculty Member Conducting Program		**Smith-Lever**
Elliott, Monica		**Expenditures**
Title of Program	**Research**	$7,690
Enhancing the productivity and business management of production nurseries in Miami-Dade County	FLA-FTL-	
Establishing Professionalism in the Commercial Green Industry	FLA-FTL-	
Integrated Turfgrass Disease Management	FLA-FTL-	
Ornamental and Turf Pest Control Manual SM7	FLA-FTL-	
Palm Diseases	FLA-FTL-	

Faculty Member Conducting Program		**Smith-Lever**
Ferguson, James		**Expenditures**
Title of Program	**Research**	$12,732
Stone Fruit Production	FLA-HOS-	
Sustainable/Organic Citrus Production	FLA-HOS-	

Faculty Member Conducting Program		**Smith-Lever**
Ferrell, Jason		**Expenditures**
Title of Program	**Research**	$19,500
Florida Cattlemen's Institute and Allied Trade Show	FLA-JAY-04176	
Peanut Production in Jackson County, 2004	FLA-JAY-04176	
Sustainable Agricultural Production in Okaloosa County 2004	FLA-JAY-04176	
Sustainable Agricultural Crop Production in Okaloosa County 2005	FLA-JAY-04176	
Sustainable Agricultural Production in Santa Rosa County, 2004	FLA-JAY-04176	
Sustainable Agriculture Production In Walton County	FLA-JAY-04176	
Weed management in agronomic crops	FLA-JAY-04176	
Weed Management in Pasture and Rangeland	FLA-JAY-04176	

Faculty Member Conducting Program		**Smith-Lever**
Fox, Alison		**Expenditures**
Title of Program	**Research**	$5,222
Assessment of the impacts and management of invasive species.	FLA-AGR-	
Management and Ecology of Invasive Aquatic, Wetland and Terrestrial Plants in Florida	FLA-AGR-	

Faculty Member Conducting Program	**Smith-Lever**

Funderburk, Joseph		**Expenditures**
Title of Program	**Research**	$8,586
Biology and Management of Arthropod Pests of Vegetables	FLA-QUN-03473	
Reduced-Risk Tactics for Thrips and Tospovirus	FLA-QUN-03473	

Faculty Member Conducting Program Gilbert, Robert		**Smith-Lever Expenditures**
Title of Program	**Research**	$13,805
Sugarcane and Rice Agronomy Extension	FLA-BGL-	
Sugarcane Cultivars	FLA-BGL-	
Sugarcane nutrition	FLA-BGL-	

Faculty Member Conducting Program Gilman, Edward		**Smith-Lever Expenditures**
Title of Program	**Research**	$15,501
Developing protocols for producing quality trees in the nursery	FLA-ENH-	
Enhancing the productivity and business management of production nurseries in Miami-Dade County	FLA-ENH-	
Grower, State & County Faculty Educational Programs	FLA-ENH-	

Faculty Member Conducting Program Gilreath, James		**Smith-Lever Expenditures**
Title of Program	**Research**	$26,535
2. Pest Management for Vegetables in Manatee County	FLA-BRA-	

Faculty Member Conducting Program Goodrich, Renee		**Smith-Lever Expenditures**
Title of Program	**Research**	$20,471
Biosecurity and Food Recall Training Program	FLA-LAL-	
Food Safety and Quality in Florida	FLA-LAL-	
Food Safety and Security of Fresh and Processed Beverages, Processed Foods and Produce	FLA-LAL-	
Food Safety, GAPs and HACCP Training	FLA-LAL-	
International Sanitation Symposium for the Food and Beverage Industry	FLA-LAL-	
Juice HACCP	FLA-LAL-	
Processing Innovations in Food Safety	FLA-LAL-	
Retail Food Safety and Quality	FLA-LAL-	
Tanker Truck Sanitation	FLA-LAL-	
Value-added Processed Citrus Products and Technology	FLA-LAL-	

Faculty Member Conducting Program Haman, Dorota		**Smith-Lever Expenditures**
Title of Program	**Research**	$16,766
Irrigation Management	FLA-AGE-	

Faculty Member Conducting Program Hansen, Gary		**Smith-Lever Expenditures**
Title of Program	**Research**	$13,751
2004 Beef Cattle Short Course	FLA-QUN-04187	
2005 Beef Cattle Short Course	FLA-QUN-04187	

Alternative Opportunties for Small & Part-time Farmers	FLA-QUN-04187
CMP 301 Jackson Livestock Extension Educational Program	FLA-QUN-04187
Florida Bull Test	FLA-QUN-04187
NFREC Beef Cattle/Forage Field Day	FLA-QUN-04187
Northwest Florida PIT Committee	FLA-QUN-04187
Sustainable Agricultural Production in Okaloosa County 2004	FLA-QUN-04187
Sustainable Agricultural Crop Production in Okaloosa County 2005	FLA-QUN-04187
Sustainable Agriculture Production In Walton County	FLA-QUN-04187

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Haydu, John

Title of Program	**Research**	$18,770
Business analysis of ornamental plant nurseries	FLA-APO-	
Generating economic information for the nursery and greenhouse industry.	FLA-APO-	
Marketing Strategies for Increasing Demand	FLA-APO-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Hewitt, Timothy

Title of Program	**Research**	$16,537
NFREC Beef Cattle/Forage Field Day	FLA-QUN-04072	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Hochmuth, George

Title of Program	**Research**	$14,080
Certified Crop Adviser Training	FLA-HOS-	
Silviculture Fertilization BMP Demonstration in Suwannee Valley	FLA-HOS-	
Small Farms	FLA-HOS-	
Suwannee River Partnership Education and Outreach	FLA-HOS-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Hodges, Alan

Title of Program	**Research**	$14,060
Agricultural awareness and economic importance to southwest Florida	FLA-ABE-	
Biomass energy development	FLA-ABE-	
Business analysis of ornamental plant nurseries	FLA-ABE-	
Economic impact analysis of agriculture and natural resources in Florida	FLA-ABE-	
Generating economic information for the nursery and greenhouse industry.	FLA-ABE-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Hutchinson, Chad

Title of Program	**Research**	$21,544
Specialist In-service Training	FLA-HOS-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Jacoby, Charles

Title of Program	**Research**	$13,270
Florida's estuarine, coastal and marine systems	FLA-FAS-03978	
Management and Ecology of Invasive Aquatic, Wetland and	FLA-FAS-03978	

Terrestrial Plants in Florida	
Marketing Extension	FLA-FAS-03978
Nonnative species in Florida's saltwater systems	FLA-FAS-03978
Specialist In-service Training	FLA-FAS-03978
University of Florida IFAS Extension Invasives Summit	FLA-FAS-03978
Watershed Education Team	FLA-FAS-03978

Faculty Member Conducting Program		**Smith-Lever Expenditures**
Knox, Gary		
Title of Program	**Research**	$14,910
Grower, State & County Faculty Educational Programs	FLA-MON-03023	
Home Horticulture	FLA-MON-03023	
Horticulture Professionals Okaloosa/Walton County 2004	FLA-MON-03023	
Leadership and Guidance for Goal 4 Teams	FLA-MON-03023	
Marketing Extension	FLA-MON-03023	
New Plants for Florida Residents	FLA-MON-03023	
New Plants for the Green Industry	FLA-MON-03023	
Regional Programming for the Commercial Landscape Industry	FLA-MON-03023	
Regional Programming for the Nursery/Greenhouse Industry	FLA-MON-03023	
Statewide Support for FYN	FLA-MON-03023	

Faculty Member Conducting Program		**Smith-Lever Expenditures**
Langeland, Kenneth		
Title of Program	**Research**	$9,147
Establishing Professionalism in the Commercial Green Industry	FLA-AGR-	
Management and Ecology of Invasive Aquatic, Wetland and Terrestrial Plants in Florida	FLA-AGR-	
University of Florida IFAS Extension Invasives Summit	FLA-AGR-	
Utilization and Conservation of Natural Resources in Santa Rosa County 2004	FLA-AGR-	

Faculty Member Conducting Program		**Smith-Lever Expenditures**
Leppla, Norman		
Title of Program	**Research**	$22,975
Integrated Pest Management (IPM) Program	FLA-ENY-	
Supplementary Hands-On Practical Materials for IPM Distance Education for Landscape Maintenance Professionals	FLA-ENY-	

Faculty Member Conducting Program		**Smith-Lever Expenditures**
Li, Yuncong		
Title of Program	**Research**	$15,522
Enhance Farm Productivity & Management (Miami-Dade)	FLA-HOM-04160	
Fruits and Vegetables Focus Group (Fruits Team)	FLA-HOM-04160	
Hydrology and water quality in the Southern Everglades Region: agricultural-rural-urban-restoration interfaces	FLA-HOM-04160	
Optimizing Fertilizer Management Practices for Crops in South Florida	FLA-HOM-04160	
Technology Adoption for Irrigation and Nutrient management	FLA-HOM-04160	
Tropical Fruit Management	FLA-HOM-04160	
Water conservation techniques to optimize water use by agricultural crops grown in very coarse calcareous soils	FLA-HOM-04160	

Faculty Member Conducting Program Liburd, Oscar		Smith-Lever Expenditures
Title of Program	**Research**	$13,763
Biology and Management of Arthropod Pests of Vegetables	FLA-ENY-	
Commercial Blueberry Production	FLA-ENY-	
Developing IPM Strategies for Managing Grape Root Borer in Florida Grape Vineyards	FLA-ENY-	
Multi-State Effort to Implement IPM Using Predatory Mites in Strawberries Through on-Farm Demonstration Trials and Extension Education	FLA-ENY-	

Faculty Member Conducting Program Main, Martin		Smith-Lever Expenditures
Title of Program	**Research**	$7,319
Florida Master Naturalist Program - Environmental Education	FLA-IMM-04136	
Master Naturalists Okaloosa/Walton County 2004	FLA-IMM-04136	

Faculty Member Conducting Program Mannion, Catharine		Smith-Lever Expenditures
Title of Program	**Research**	$20,166
Enhancing the productivity and business management of production nurseries in Miami-Dade County	FLA-HOM-03490	
First Detector Educator In-Service Training	FLA-HOM-03490	
Pesticide Applicator and other Pesticide Training & Recertification (Miami-Dade)	FLA-HOM-03490	

Faculty Member Conducting Program Miller, Deborah		Smith-Lever Expenditures
Title of Program	**Research**	$3,634
Ecology and Restoration of Lower Coastal Plain Ecosystem	FLA-QUN-04236	

Faculty Member Conducting Program Momol, Timur		Smith-Lever Expenditures
Title of Program	**Research**	$22,691
Alternative Opportunties for Small & Part-time Farmers	FLA-PLP-	
DDIS / NPDN / SPDN	FLA-PLP-	
Educate homeowners in Walton County on home horticulture and gardening through the Master Gardener Program and its volunteers.	FLA-PLP-	
Etiology and Integrated Management of Vegetable and Ornamental Plant Diseases in North Florida	FLA-PLP-	
Florida Extension Plant Diagnostic Clinic - Quincy	FLA-PLP-	
Florida Plant Diagnostic Network (Member of SPDN and NPDN)	FLA-PLP-	
Home Horticulture	FLA-PLP-	
Master Gardeners Okaloosa/Walton County 2004	FLA-PLP-	
Ornamental and Turf Pest Control Manual SM7	FLA-PLP-	
Reduced-Risk Tactics for Thrips and Tospovirus	FLA-PLP-	
Southern Plant Diagnostic Clinic, First Responder Training	FLA-PLP-	

Faculty Member Conducting Program Munoz-carpena, Rafael		Smith-Lever Expenditures
Title of Program	**Research**	$13,773

Fruits and Vegetables Focus Group (Fruits Team)	FLA-HOM-04016
Hydrology and water quality in the Southern Everglades Region: agricultural-rural-urban-restoration interfaces	FLA-HOM-04016
Irrigation Management	FLA-HOM-04016
Optimizing Fertilizer Management Practices for Crops in South Florida	FLA-HOM-04016
Technology Adoption for Irrigation and Nutrient management	FLA-HOM-04016
Tropical Fruit Management	FLA-HOM-04016
Water conservation techniques to optimize water use by agricultural crops grown in very coarse calcareous soils	FLA-HOM-04016

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Muraro, Ronald

Title of Program	**Research**	$7,945
Budgeting/Finance/Marketing Program	FLA-LAL-	
Economical Citrus School	FLA-LAL-	
Harvesting/Fresh Packing/Juice Processing	FLA-LAL-	
International Comparataive Costs	FLA-LAL-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Myer, Robert

Title of Program	**Research**	$7,511
Alternative feeds for Livestock	FLA-MAR-03040	
CMP 301 Jackson Livestock Extension Educational Program	FLA-MAR-03040	
NFREC Beef Cattle/Forage Field Day	FLA-MAR-03040	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Mylavarapu, Sambasiva Rao

Title of Program	**Research**	$20,234
Certified Crop Adviser Training	FLA-SWS-	
Certified Crop Advisor Training, SWFREC, June, 2004	FLA-SWS-	
CSREES Southern Regional Water Quality Program	FLA-SWS-	
Suwannee River Partnership Education and Outreach	FLA-SWS-	
Training for Comprehensive Nutrient Management Planning for Technical Service Providers	FLA-SWS-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Nagata, Russell

Title of Program	**Research**	$6,432
: IPM Programs for Commercial Vegetables with an Emphasis on Disease and Pest Identification and Non-Chemical Controls	FLA-BGL-	
Vegetable Cultivar Evaluations	FLA-BGL-	
Vegetable Production Efficiency	FLA-BGL-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Noling, Joseph

Title of Program	**Research**	$8,113
2. Pest Management for Vegetables in Manatee County	FLA-LAL-	
Nematode Assay Lab	FLA-LAL-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Norcini, Jeffrey

Title of Program	Research	$11,750
Establishment and Maintenance of Sustainable Native Wildflower Plantings	FLA-MON-03625	
Grower, State & County Faculty Educational Programs	FLA-MON-03625	
Native Forest Ecosystem Restoration and Management	FLA-MON-03625	
Native Wildflower Seed Production	FLA-MON-03625	
New Plants for Florida Residents	FLA-MON-03625	
Nursery Crop Weed Management	FLA-MON-03625	
Ornamental and Turf Pest Control Manual SM7	FLA-MON-03625	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Nowak, Jaroslaw

Title of Program	Research	$6,584
Agroforestry	FLA-QUN-04127	
Alternative Opportunties for Small & Part-time Farmers	FLA-QUN-04127	
Forest Stewardship Program	FLA-QUN-04127	
Management of Private Non-Industrial Forests in Walton, Holmes, Okaloosa Counties	FLA-QUN-04127	
Native Forest Ecosystem Restoration and Management	FLA-QUN-04127	
Silviculture Fertilization BMP Demonstration in Suwannee Valley	FLA-QUN-04127	
Southern Pine Beetle Prevention Education	FLA-QUN-04127	
Utilization and Conservation of Natural Resources in Okaloosa County 2004	FLA-QUN-04127	
Utilization and Conservation of Natural Resources in Santa Rosa County 2004	FLA-QUN-04127	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Nuessly, Gregg

Title of Program	Research	$6,544
Pest and Disease Management in South Florida Vegetables	FLA-ENY-	
Sugarcane Cultivars	FLA-ENY-	
Sugarcane nutrition	FLA-ENY-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Obreza, Thomas

Title of Program	Research	$22,810
Certified Crop Adviser Training	FLA-IMM-03529	
Certified Crop Advisor Training, SWFREC, June, 2004	FLA-IMM-03529	
Community Wastewater and Solid Waste Management	FLA-IMM-03529	
CSREES Southern Regional Water Quality Program	FLA-IMM-03529	
Editing the rewrite of SP169 "Nutrition of Florida Citrus Trees"	FLA-IMM-03529	
Irrigation Management	FLA-IMM-03529	
Matching Rootstocks to Soil and Site Factors to Improve Grove Profitability	FLA-IMM-03529	
Plant Nutrient Management Education	FLA-IMM-03529	
Small Farms	FLA-IMM-03529	
Suwannee River Partnership Education and Outreach	FLA-IMM-03529	
Watershed Education Team	FLA-IMM-03529	

Faculty Member Conducting Program — **Smith-Lever Expenditures**

Olson, Stephen

Title of Program	Research	$14,710
Alternative Opportunties for Small & Part-time Farmers	FLA-QUN-03086	

Commercial Vegetable and Melon Production	FLA-QUN-03086	
Development and evaluation of vegetable varieties and introduction of new crops	FLA-QUN-03086	
Home Horticulture	FLA-QUN-03086	
Improved Cultural Practices	FLA-QUN-03086	
Master Wildlife Conservationist	FLA-QUN-03086	
Reduced-Risk Tactics for Thrips and Tospovirus	FLA-QUN-03086	

Faculty Member Conducting Program		**Smith-Lever**
Osborne, Lance		**Expenditures**
Title of Program	**Research**	$14,020
Association of Specialty Cut Flower Growers- 2004 National Conference	FLA-APO-	
Best management practices for Florida's Cut Foliage and other Ornamental Plant Industries	FLA-APO-	
Scout Training and Production of Biological Control Agents at Correctional Facilities	FLA-APO-	
Scouting School	FLA-APO-	
University of Florida IFAS Extension Invasives Summit	FLA-APO-	

Faculty Member Conducting Program		**Smith-Lever**
Parish, Mickey		**Expenditures**
Title of Program	**Research**	$7,830
Biosecurity and Food Recall Training Program	FLA-LAL-	
Food Safety and Security of Fresh and Processed Beverages, Processed Foods and Produce	FLA-LAL-	
International Sanitation Symposium for the Food and Beverage Industry	FLA-LAL-	
Juice HACCP	FLA-LAL-	
Professional Society Symposium Development 2004	FLA-LAL-	
Tanker Truck Sanitation	FLA-LAL-	

Faculty Member Conducting Program		**Smith-Lever**
Parsons, Lawrence		**Expenditures**
Title of Program	**Research**	$21,908
Certified Crop Adviser Training	FLA-LAL-	
Citrus Irrigation Management & Freeze Protection	FLA-LAL-	

Faculty Member Conducting Program		**Smith-Lever**
Peres, Natalia		**Expenditures**
Title of Program	**Research**	$19,500
Scouting School	FLA-BRA-	

Faculty Member Conducting Program		**Smith-Lever**
Pernezny, Kenneth		**Expenditures**
Title of Program	**Research**	$43,799
: IPM Programs for Commercial Vegetables with an Emphasis on Disease and Pest Identification and Non-Chemical Controls	FLA-BGL-	
Development and Delivery of Canker Education to Diverse Audiences in Florida	FLA-BGL-	

Faculty Member Conducting Program	**Smith-Lever**
Price, James	**Expenditures**

Title of Program	Research	$13,954
Integrated management of strawberry diseases in winter fruit production areas	FLA-BRA-	
Integrated Pest Management in Strawberry	FLA-BRA-	
Scouting School	FLA-BRA-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**
Raid, Richard

Title of Program	Research	$22,057
: IPM Programs for Commercial Vegetables with an Emphasis on Disease and Pest Identification and Non-Chemical Controls	FLA-BGL-	
Pest and Disease Management in South Florida Vegetables	FLA-BGL-	
Sugarcane Cultivars	FLA-BGL-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**
Rey, Jorge

Title of Program	Research	$7,511
Encephalitis Information System	FLA-FME-	
Hands-on Educational Materials for Florida Teachers	FLA-FME-	
IPM for Mosquito Control	FLA-FME-	
Medical & Veterinary Entomology for Public Health	FLA-FME-	
Oslo Riverfront Conservation Area	FLA-FME-	

Faculty Member Conducting Program — **Smith-Lever Expenditures**
Rich, Jimmy

Title of Program	Research	$8,100
In-Service Agent Nematology Training	FLA-QUN-03021	
Nematode Assay Lab	FLA-QUN-03021	
Nematode Management in Agronomic Crops	FLA-QUN-03021	
Nematode Survey in North Florida Agronomic Crops	FLA-QUN-03021	
Onfarm Nematicide Field Trial Demonstrations	FLA-QUN-03021	
Peanut Production in Jackson County, 2004	FLA-QUN-03021	

Faculty Member Conducting Program — **Smith-Lever Expenditures**
Roberts, Pamela

Title of Program	Research	$18,095
2. Pest Management for Vegetables in Manatee County	FLA-IMM-04133	
Development and Delivery of Canker Education to Diverse Audiences in Florida	FLA-IMM-04133	
Exotic Citrus Diseases in Florida	FLA-IMM-04133	
Fruits and Vegetables Focus Group (Fruits Team)	FLA-IMM-04133	
Pest and Disease Management in South Florida Vegetables	FLA-IMM-04133	

Faculty Member Conducting Program — **Smith-Lever Expenditures**
Roka, Fritz

Title of Program	Research	$13,261
Agricultural awareness and economic importance to southwest Florida	FLA-HOS-	
Budgeting/Finance/Marketing Program	FLA-HOS-	
Citrus Mechanical Harvesting	FLA-HOS-	
Farm safety and regulation compliance - SW Florida	FLA-HOS-	
Farm Safety and Regulatory Compliance	FLA-HOS-	
Florida Citrus Expo	FLA-HOS-	
Hispanic Farm Safety Education	FLA-HOS-	

Faculty Member Conducting Program Rouse, Robert		**Smith-Lever Expenditures**
Title of Program	**Research**	$7,688
Budgeting/Finance/Marketing Program	FLA-IMM-03011	
Certified Crop Advisor Training, SWFREC, June, 2004	FLA-IMM-03011	
Citrus Mechanical Harvesting	FLA-IMM-03011	
Farm safety and regulation compliance - SW Florida	FLA-IMM-03011	
Florida Citrus Expo	FLA-IMM-03011	
Stone Fruit Production	FLA-IMM-03011	

Faculty Member Conducting Program Sargent, Steven		**Smith-Lever Expenditures**
Title of Program	**Research**	$16,834
Commercial Blueberry Production	FLA-HOS-	
Food Safety and Quality in Florida	FLA-HOS-	
Fruits and Vegetables Focus Group (Fruits Team)	FLA-HOS-	
Postharvest Cross-commodity Program:	FLA-HOS-	
Postharvest Technologies for Small Farms	FLA-HOS-	
Postharvest Technologies for Tropical Fruits	FLA-HOS-	
Postharvest Technologies for Vegetables	FLA-HOS-	
Retail Food Safety and Quality	FLA-HOS-	
Safe produce handlers/workers	FLA-HOS-	

Faculty Member Conducting Program Schmidt, Ronald		**Smith-Lever Expenditures**
Title of Program	**Research**	$8,619
Biosecurity and Food Recall Training Program	FLA-LAL-	
Extension Programs in Dairy Foods Industry	FLA-LAL-	
Extension Programs in Food Industry and Food Regulatory Sectors	FLA-LAL-	
Food Safety and Quality in Florida	FLA-LAL-	
Food Safety in Citrus Co.	FLA-LAL-	
Food Safety, GAPs and HACCP Training	FLA-LAL-	
International Sanitation Symposium for the Food and Beverage Industry	FLA-LAL-	
Processing Innovations in Food Safety	FLA-LAL-	
Retail Food Safety and Quality	FLA-LAL-	
Tanker Truck Sanitation	FLA-LAL-	

Faculty Member Conducting Program Schneider, Keith		**Smith-Lever Expenditures**
Title of Program	**Research**	$17,258
Biosecurity and Food Recall Training Program	FLA-LAL-	
Food Safety and Quality in Florida	FLA-LAL-	
Food Safety and Security of Fresh and Processed Beverages, Processed Foods and Produce	FLA-LAL-	
Food Safety, GAPs and HACCP Training	FLA-LAL-	
International Sanitation Symposium for the Food and Beverage Industry	FLA-LAL-	
Juice HACCP	FLA-LAL-	
Retail Food Safety and Quality	FLA-LAL-	
Safe produce handlers/workers	FLA-LAL-	
Tanker Truck Sanitation	FLA-LAL-	

Faculty Member Conducting Program		Smith-Lever Expenditures
Schuster, David		
Title of Program	**Research**	$10,854
2. Pest Management for Vegetables in Manatee County	FLA-BRA-	
Biology and Management of Arthropod Pests of Vegetables	FLA-BRA-	
Implementing a Resistance Management Program for Nicotinoid Use Against the Silverleaf Whitefly on Tomato	FLA-BRA-	
Pest and Disease Management in South Florida Vegetables	FLA-BRA-	

Faculty Member Conducting Program		Smith-Lever Expenditures
Sharma, Jyotsna		
Title of Program	**Research**	$6,896
Environmental Remediation and Water Quality	FLA-QUN-04180	
Grower, State & County Faculty Educational Programs	FLA-QUN-04180	
Production, Transition, and Handling of Nursery Crops	FLA-QUN-04180	
Rare Plant Ecology and Conservation	FLA-QUN-04180	
Tri-State sHort Course	FLA-QUN-04180	

Faculty Member Conducting Program		Smith-Lever Expenditures
Shukla, Sanjay		
Title of Program	**Research**	$25,150
Certified Crop Advisor Training, SWFREC, June, 2004	FLA-ABE-	
CSREES Southern Regional Water Quality Program	FLA-ABE-	
Irrigation Management	FLA-ABE-	
Watershed Education Team	FLA-ABE-	

Faculty Member Conducting Program		Smith-Lever Expenditures
Simonne, Amarat		
Title of Program	**Research**	$6,738
Food Safety and Quality in Florida	FLA-FYC-	
Processing Innovations in Food Safety	FLA-FYC-	
Reducing Health Risks With Good Nutrition	FLA-FYC-	
Retail Food Safety and Quality	FLA-FYC-	
Safe produce handlers/workers	FLA-FYC-	

Faculty Member Conducting Program		Smith-Lever Expenditures
Simonne, Eric		
Title of Program	**Research**	$13,762
1. Water and Fertilizer Management in Vegetable Production in Manatee County	FLA-HOS-	
Small farm and alternative agriculture	FLA-HOS-	
Technology Adoption for Irrigation and Nutrient management	FLA-HOS-	

Faculty Member Conducting Program		Smith-Lever Expenditures
Sprenkel, Richard		
Title of Program	**Research**	$24,275
Alternative Opportunties for Small & Part-time Farmers	FLA-QUN-04219	
Arthropod Identification, Biology and Management in North Florida	FLA-QUN-04219	
Cotton Production and Pest Management	FLA-QUN-04219	
Educate homeowners in Walton County on home horticulture and gardening through the Master Gardener Program and its volunteers.	FLA-QUN-04219	

Home Horticulture	FLA-QUN-04219	
Master Wildlife Conservationist	FLA-QUN-04219	
Peanut Production in Jackson County, 2004	FLA-QUN-04219	
Scout Training	FLA-QUN-04219	

Faculty Member Conducting Program		**Smith-Lever**
Stall, William		**Expenditures**
Title of Program	**Research**	$15,589
2. Pest Management for Vegetables in Manatee County	FLA-HOS-	
Weed management in vegetable production	FLA-HOS-	

Faculty Member Conducting Program		**Smith-Lever**
Stamps, Robert		**Expenditures**
Title of Program	**Research**	$17,787
Best management practices for Florida's Cut Foliage and other Ornamental Plant Industries	FLA-APO-	
Grower, State & County Faculty Educational Programs	FLA-APO-	
Ornamental and Turf Pest Control Manual SM7	FLA-APO-	
Production of Cut Foliage Crops	FLA-APO-	

Faculty Member Conducting Program		**Smith-Lever**
Stanley, Craig		**Expenditures**
Title of Program	**Research**	$8,009
Water and nutrient management to minimize detriment impact on surface and groundwater resourses	FLA-BRA-	

Faculty Member Conducting Program		**Smith-Lever**
Stansly, Philip		**Expenditures**
Title of Program	**Research**	$6,793
Biology and Management of Arthropod Pests of Vegetables	FLA-IMM-03265	
Florida Citrus Expo	FLA-IMM-03265	
Implementing a Resistance Management Program for Nicotinoid Use Against the Silverleaf Whitefly on Tomato	FLA-IMM-03265	
Pest and Disease Management in South Florida Vegetables	FLA-IMM-03265	

Faculty Member Conducting Program		**Smith-Lever**
Thetford, Mack		**Expenditures**
Title of Program	**Research**	$3,530
Grower, State & County Faculty Educational Programs	FLA-JAY-03609	
Horticulture Professionals Okaloosa/Walton County 2004	FLA-JAY-03609	
Idenification, Evaluation and Utilization of Ornamental Plants for Florida Landscapes	FLA-JAY-03609	
Tri-State sHort Course	FLA-JAY-03609	

Faculty Member Conducting Program		**Smith-Lever**
Timmer, Lavern		**Expenditures**
Title of Program	**Research**	$23,027
Development and Delivery of Canker Education to Diverse Audiences in Florida	FLA-LAL-	
Exotic Citrus Diseases in Florida	FLA-LAL-	
Florida Citrus Expo	FLA-LAL-	
Management of foliar fungal diseases of citrus	FLA-LAL-	

Reducing spread of citrus canker in Florida	FLA-LAL-	

Faculty Member Conducting Program Trenholm, Laurie		**Smith-Lever Expenditures**
Title of Program	**Research**	$17,029
Best Management Practices	FLA-ENH-	
Establishing Professionalism in the Commercial Green Industry	FLA-ENH-	
Grower, State & County Faculty Educational Programs	FLA-ENH-	
Horticulture Professionals Okaloosa/Walton County 2004	FLA-ENH-	
Leadership and Guidance for Goal 4 Teams	FLA-ENH-	
Statewide Support for FYN	FLA-ENH-	

Faculty Member Conducting Program Vansickle, John		**Smith-Lever Expenditures**
Title of Program	**Research**	$23,001
Vegetable Production Harvesting and Handling Efficiencies in Florida	FLA-FRE-03211	

Faculty Member Conducting Program White, James		**Smith-Lever Expenditures**
Title of Program	**Research**	$6,625
Potato industry support	FLA-SAN-	
Small farm and alternative agriculture	FLA-SAN-	
Vegetable Growers Advisory	FLA-SAN-	

Faculty Member Conducting Program Williamson, Jeffrey		**Smith-Lever Expenditures**
Title of Program	**Research**	$7,200
Commercial Blueberry Production	FLA-HOS-	
Development and Delivery of Canker Education to Diverse Audiences in Florida	FLA-HOS-	
Fruits and Vegetables Focus Group (Fruits Team)	FLA-HOS-	
Stone Fruit Production	FLA-HOS-	

Faculty Member Conducting Program Wilson, Sandra		**Smith-Lever Expenditures**
Title of Program	**Research**	$6,884
Grower, State & County Faculty Educational Programs	FLA-QUN-04236	

Faculty Member Conducting Program Wright, David		**Smith-Lever Expenditures**
Title of Program	**Research**	$34,678
Alternative Opportunties for Small & Part-time Farmers	FLA-QUN-03334	
Corn Production and Fertility Requirements	FLA-QUN-03334	
Exchange program with German students	FLA-QUN-03334	
Hardlock cotton	FLA-QUN-03334	
Livestock Integration into Conservation Cropping Systems	FLA-QUN-03334	
NFREC fall field day	FLA-QUN-03334	
Peanut Production in Jackson County, 2004	FLA-QUN-03334	
Peanut Variety Selection and Utilization	FLA-QUN-03334	
Sustainable Agricultural Crop Production in Okaloosa County 2005	FLA-QUN-03334	
Sustainable Agricultural Production in Santa Rosa County, 2004	FLA-QUN-03334	

Faculty Member Conducting Program Yanong, Roy		**Smith-Lever Expenditures**
Title of Program	**Research**	$7,214
Aquatic Animal Health Continuing Education	FLA-FAS-03955	
Disease Diagnostics, Management, and Therapy	FLA-FAS-03955	
Fish Reproduction	FLA-FAS-03955	
Regulatory Issues	FLA-FAS-03955	
Workshop - 2 Day Fish Health Management	FLA-FAS-03955	

Faculty Member Conducting Program Yeager, Thomas		**Smith-Lever Expenditures**
Title of Program	**Research**	$19,212
Commercial Horticulture Winter Meeting: Nutritional Disorder Workshop	FLA-ENH-	
Enhancing the productivity and business management of production nurseries in Miami-Dade County	FLA-ENH-	
Grower, State & County Faculty Educational Programs	FLA-ENH-	
Horticulture Professionals Okaloosa/Walton County 2004	FLA-ENH-	

Total Integrated	$1,454,430

XIII. STATISTICAL TABLES

Total Formula Funds Expended by Goal

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
1862 Extension	$2,692,904	$221,553	$186,578	$472,254	$1,143,486	$4,716,770
1862 Hatch	$1,423,742	$199,810	$44,853	$436,775	$46,837	$2,152,017
1862 McIntire Stennis	$ 363,279	$ 50,983	$11,445	$111,447	$11,951	$ 549,104
1862 Research Total	$1,787,021	$250,793	$56,297	$548,222	$58,788	$2,701,121
1890 Extension	$576,515	$171,410	$248,788	$90,690	$250,302	$1,337,705
*1890 Research						

*1890 Research will report separately

Multi-State Funds Expended by Goal

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
1862 Extension	$1,099,951	$84,583	$60,049	$190,573	$312,932	$1,748,089
1862 Research	N/A	N/A	N/A	N/A	N/A	N/A

1862 Integrated Extension/Research Expended by Goal

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
1862 Extension	$915,171	$70,374	$49,961	$158,560	$260,363	$1,454,430
1862 Research	$525,983	$73,817	$16,570	$161,361	$ 17,303	$ 795,034
*1890 Extension						
*1890 Research						

*1890 will report separately

1862 Extension Matching Funds

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
Federal Smith-Lever	$ 2,692,904	$ 221,553	$ 186,578	$ 472,254	$1,143,486	$ 4,716,770
State	$14,851,989	$1,258663	$1,059,975	$2,682,690	$7,003,847	$26,857,165
County	$16,601,633	$1,406,941	$1,184,845	$2,998,725	$7,828,937	$30,021,082

1862 Research Matching Funds

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
State	$43,854,248	$3,410,317	$1,010,546	$14,267,413	$4,745,614	$67,288,140

1890 State Matching Funds

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
State	$372,221	$139,583	$158,194	$74,445	$186,111	$930,553

FTEs and Sys

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
1862 Extension (FTEs)	39	1	3	3	8	54
1862 Research (Sys)	50	3	1	17	5	76

XIV. APPENDIX

a. LIST OF HATCH PROJECTS

ABE-04016	Development and Evaluation of Tmdl Planning and Assessment Tools and Processes
AGR-03594	Formation, Sprouting And Longevity Of Hydrilla Tubers
AGR-03667	Molecular Improvement Of Peanut And Sugarcane
AGR-03706	Reproductive Biology And Gametophytic Selection In Higher Plants
AGR-03726	Evaluation of Forage Germplasm and Forage Management Practices
AGR-03854	Selection and adaptation of grass and legume species for forage production in the southern coastal plain and penisula
AGR-03983	Conservation Tillage Multiple Cropping Management Strategies for Greater Sustainability
AGR-04076	Dissection of Trait Components and Molecular Improvement of Grasses through Genetic Engineering
AGR-04083	Genetic Improvement of Forage Grass and Legume Species
ANS-03659	Metabolic Relationships In Supply Of Nutrients For Lactatingcows
ANS-03818	Improvement of Beef Cattle in Multibreed Populations: Phase Iii
ANS-03821	Synchronization of estrus in cattle of Bos indicus breeding
ANS-03859	Use of bst, shortening the dry period, and prepartum feeding of anionic salts to improve milk production and health c
ANS-03980	Improving Efficiencies of In Vitro Embryo Production Technologies in Cattle.
ANS-04111	Influence of Nutrition and Management on Skeletal Development of Growing Horses
APO-03523	Management Of Diseases Of Tropical Foliage Plants
APO-03609	Introduction And Evaluation Of Ornamental Plants
APO-03875	Development Of New Potato Clones For Environmental And Economical Sustainability In The Northeast
APO-04012	Biology and Management of Arthropod Pests of Vegetables
BGL-03711	Turfgrass Fertility Management and Environmental Impact
BGL-04012	Biology and Management of Arthropod Pests of Vegetables
BRA-03609	Introduction And Evaluation Of Ornamental Plants
BRA-03764	Strawberry Cultivar Development
BRA-04012	Biology and Management of Arthropod Pests of Vegetables
DOV-03586	The Epidemiology And Control Of Strawberry Diseases
DOV-03764	Strawberry Cultivar Development
ENH-03600	Morphological And Physiological Responses Of Chimeral Plants To Environmental Factors
ENH-03602	Taxonomy And Boisystematics Of Cultivated Plants
ENH-03609	Introduction And Evaluation Of Ornamental Plants
ENH-03669	Effects Of Horticulture, Gardening Experiences, And Green Spaces On Human Populations
ENH-04069	Cultural Systems for Specialty Cut Flowers and Other New Ornamental Crops for Florida
ENY-03694	Managing Plant-parasitic Nematodes in Sustainable Agriculture with Emphasis on Crop Resistance
ENY-03723	Conservation and Laboratory Rearing of Butterflies
ENY-03788	Development of Ecological Methods for Nematode Management
ENY-03796	Biological Control of Scapteriscus Mole Crickets
ENY-03942	Toxicology of Agriculturally Important Insect Pests of Florida
ENY-03961	Selection of Honey Bees for Suppressed Reproduction of the Parasitic Varroa Mite and Mapping of the Quantitative
ENY-04011	A Comparative Analysis of Plant and Insect Parasitic Nematodes: a Novel Approach to Controlling Insect Pests and
ENY-04012-L	Biology and Management of Arthropod Pests of Vegetables
ENY-04012-W	Biology and Management of Arthropod Pests of Vegetables
ENY-04025	Chemical Ecology and Management of Insect Pests of Blueberry, Vaccinium spp., in Florida
FME-03966	Predicting mosquito-borne disease transmission in Florida

FOS-03513	Controlled Dietary Folate Effect On Folate Status In Elderlywomen
FOS-03741	Food Technology Research Support to Florida Agriculture Industries in Value Adding Enterprises
FOS-03764	Strawberry Cultivar Development
FOS-03840	Biotin Metabolism in a Rat Model of Sepsis
FOS-03910	Phytochemical and Quality Assessment of Fresh and Processed Fruits and Vegetables
FOS-04098	Optimizing Health with Folate and Related Nutrients Throughout the Lifespan
FRE-03571	Dynamic Economic Analysis Of The Florida Citrus Industry
FRE-03584	Private Strategies, Public Policies, And Food System Performance
FRE-03597	Factors Affecting The Cost Of Capital In Rural Communities: Changing Competition And Regulations
FRE-03599	The Effect Of Farmland Boom/bust Cycles On The Rural Economy
FRE-03660	Food Demand, Nutrition And Consumer Behavior
FRE-03701	Agricultural and Food Product Logistics: Implications for Florida and the U.s. in a World Market
FRE-03863	The Efficiency of Alternative Natural Resource and Environmental Policies and Practices
FRE-04005	Consumer Attitudes and Preferences Regarding Florida Agricultural Products.
FTL-03539	The Influence Of Edaphic Factors On Growth Of Torpedograss, Maidencane, And Hygrophila And Their Res
FTL-03602	Taxonomy And Biosystematics Of Cultivated Plants
FTL-03607	Bionomics And Management Of Hemipterous Pests Of Woody Ornamental Plants And Turfgrasses In Florida
FTL-03609	Introduction And Evaluation Of Ornamental Plants
FTL-03620	Weed Biology And Control For Turfgrass And The Landscape
FTL-03711	Turfgrass Fertility Management and Environmental Impact
FTL-03754	Coconut Lethal Yellowing and Related Diseases
FTL-03807	Integrated Management of Ornamental Plant Pests
FTL-04047	Behavioral Ecology and Control of Subterranean Termites
FTL-04066	Environmental Management of Weeds in Turfgrass
FTP-03700	Plant Growth Regulators To Enhance Profitability Of Fresh And Processed Florida Citrus
FYC-03923	Evaluation Research in the Area of Youth Development and Youth Crime and Violence in Public Schools
FYC-03960	Enhancing Food Safety and Quality Through Technologies and Consumer Research
HOM-03998	Sustainable Vegetable Production Systems for South Florida Based On Use of Cover Crops, Precision Irrigation and
HOS-03559	Senescence Physiology And Deterioration In Harvested Tomato And Other Fruits
HOS-03601	Identification Of Genetic And Physiological Mechanisms Of Thermotolerance In Lettuce Seed
HOS-03675	Regulation of Photosynthetic Processes
HOS-03700	Plant Growth Regulators To Enhance Profitability Of Fresh And Processed Florida Citrus
HOS-03729	Genetic and Molecular Characterization of Plant Genes involved in Disease Resistance
HOS-03822	Development of Snap Bean Varieties and Genetic Investigations in Common Bean
HOS-04031	Development of Plant Pathogens as Bioherbicides for Weed Control
HOS-04108	Development of New Potato Clones for Improved Pest Resistance, Marketability, and Sustainability in the Eastern U
IMM-03571	Dynamic Economic Analysis Of The Florida Citrus Industry
IMM-03622	Water Management In Flatwoods Citrus Groves
IMM-04012	Biology and Management of Arthropod Pests of Vegetables
JAY-03609	Introduction And Evaluation Of Ornamental Plants
JAY-03620	Weed Biology And Control For Turfgrass And The Landscape
LAL-03571	Dynamic Economic Analysis Of The Florida Citrus Industry
LAL-03770	Environmental Effects on Vegetative and Reproductive Growth of Citrus
LAL-03788	Development of Ecological Methods for Nematode Management
LAL-03897	Soil Microbial Taxonomic And Functional Diversity As Affected By Land Use And Management
LAL-04057	Citrus By-products and Processing Technology Development
MCS-03861	Genetic Engineering of Zymomonas mobilis for Fuel Ethanol Production
ONA-03726	Evaluation of Forage Germplasm and Forage Management Practices.
PLP-03524	Identification, Management, And Control Of Viruses Infectingng Ornamental And Related Crops
PLP-03586	The Epidemiology And Control Of Strawberry Diseases

PLP-03588	Sanitation In Post Harvest Handling Practices For Fresh Fruits And Vegetables
PLP-03603	Enhancing The Sustainability Of Commercial Peanut Productionthrough Improved Disease Management
QUN-03609	Introduction And Evaluation Of Ornamental Plants
QUN-03693	Dynamic Soybean Insect Management For Emerging Agricultural Technologies And Variable Environments
QUN-03706	Reproductive Biology And Gametophytic Selection In Higher Plants
QUN-03854	Selection and Adaptation of Grass and Legume Species for Forage Production in the Southern Coastal Plain and Pen
QUN-04012	Biology and Management of Arthropod Pests of Vegetables
SWS-03711	Turfgrass Fertility Management and Environmental Impact
SWS-03820	Pedological Research in Florida
WEC-03618	Savanna Ecology And Management: Role Of Fire, Grazing, And Exotic Species

b. EXTENSION GOAL* AND FOCUS AREAS

(**NOTE**: IN THIS REPORT THE FLORIDA GOALS ARE REFERRED TO AS **"PLANNED PROGRAMS"** TO REDUCE THE CONFUSION WITH NATIONAL GOALS)*

UF/IFAS and FAMU/CESTA Extension
Statewide Goals and Focus Areas for 2004-2007[1]

I. **To Enhance and Maintain Agricultural and Food Systems**

1. Agricultural Profitability and the Sustainable Use of Environmental Resources *(Example topics include economic analysis, public policies, irrigation practices, varietal improvements, best management practices related to production and marketing, pest management, and fertility management)* Task forces will be created to address profitability as it impacts commodities.

2. Awareness of Agriculture's Importance to an Economy That Ranges From Local to Global *(The agriculture and natural resources industries are major contributors to Florida's economy, generating billions of dollars of revenue and tax contributions and hundreds of thousands of jobs every year. In addition to these significant monetary impacts, these industries benefit the state by providing wildlife habitat, aquifer recharge areas and areas of open space)*

3. Processing, Distribution, Safety and Security of Food Systems *(Example topics include safe food handling practices from farm to forks with emphasis on safe food handling techniques, new food technologies, and a better understanding of current food systems)*

4. Plant, Animal, and Human Protection *(Example topics include IPM, diagnostics, pesticide and farm safety programs, veterinary medicine programs dealing with insects such as mosquitoes and ticks)*

Commodity Action Teams
- Agronomic Row Crops
- Sugarcane and Rice
- Vegetables *(includes tropical and small fruits)*
- Ornamentals and Turf
- Animal Sciences / Forages
- Citrus
- Small Farms
- Aquaculture
- Forestry

II. **To Maintain and Enhance Florida's Environment**

1. Water Resources *(Example topics include conservation, non-point source pollution, education)*

[1] April 4, 2005

2. Conservation and Sustainable Use of Freshwater and Terrestrial Natural Resources and Ecosystems *(Example topics include recreation, marine, boating, wildlife, forests, exotics, wetlands, natural resource management)*

3. Environmental Education *(Example topics include helping youth understand their interdependence with the environment, local ecosystem, energy and other natural resources)*

4. Conservation and Sustainable Use of Coastal and Marine Natural Resources and Ecosystems *(Example topics include energy focused housing, transportation, planning, water, economy, land use, pests, landscapes and wild fires, natural areas, public property)*

III. To Develop Responsible and Productive Youth Through 4-H and Other Youth Programs

1. Life Skills Developed in Youth Through Subject Matter Experiences *(Example topics include positive relationships, service and leadership and effective communication skills)*

2. Organizational Strategies and Learning Environments to Support Youth Programs. *(Example topics include developing a sense of belonging in an inclusive environment through their participation in organized 4-H programs)*

3. Volunteer Development and Systems to Support Youth *(Example topics include providing for physically and emotionally safety of youth through sustained relationships with positive, supportive adult mentor(s).*

IV. To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow

1. Residential Landscapes

2. Commercial Horticultural/Urban Forestry Services *(Example topics include community gardens, golf courses, recreation areas, turfgrass and landscape management practices)*

3. Florida Yards and Neighborhoods *(Example topics include integration of the landscape characteristics of site conditions, landscape design, plant selection and placement, lawn irrigation, fertilization, pest control, mowing, pruning and recycling)*

V. To Assist Individuals and Families To Achieve Economic Well-Being and Life Quality

1. Personal and Family Well-Being *(Example topics include appropriate nurturance and guidance to children and youth, high quality care programs, and support for families using care facilities)*

2. Financial Management and Economic Well-Being *(Example topics include strengthening the capacity of families to establish and maintain economic security and build their future)*

3. Nutrition, Food Safety, and Health *(Example topics include enhanced health status and vitality supported by high quality diets and food management practices; safe handling, preparation and storage of food healthy behaviors and lifestyles)*

4. Housing and Environment *(Example topics include housing choices appropriate to their financial situation and needs, Consumer reduction of home energy use, improving indoor air quality environments, energy-focused housing)*

5. NEW: Nonprofit Organizations, Leadership and Volunteer Development

VI. **To Achieve Economic Prosperity and Community Vitality in Florida's Urban and Rural Communities**

1. Economic Development and Community Services and Infrastructure *(Example topics include assisting local governments and communities to investigate and create viable options in job retention and creation, tourism development, workforce education)*

2. Community Preparedness *(Example topics include assisting communities in "Beach safety and preparedness" by developing programs that address issues of rip currents, shark attacks, coastal storms, and hurricanes; Assisting communities in development of plans and procedures for natural disasters; developing better predictive models to enhance the decision-making process in natural disaster events; working with planning agencies to incorporate construction and design practices for both shorelines and buildings that reduce shoreline erosion; working with community leaders in development of plans and procedures in the area of homeland security)*

3. Safety for Agricultural Operations and Equipment

c. FAIR REPORT

Florida Farm Bureau Federation IFAS Task Force

Carl B. Loop, Jr.	Jacksonville
Rick Roth	Belle Glade
John Hoblick	DeLeon Springs
Wayne Smith	Hastings
Ken Smith	Brooksville
Pat Cockrell	Staff Coordinator

Executive Summary of the
Florida Agricultural Industry Review of the University of Florida/
Institute of Food and Agricultural Sciences
(The FAIR Report of IFAS)
to the Florida Farm Bureau Federation Board of Directors
December 2002

Prepared by Pat Cockrell formatted and edited by Linda Dixon

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II Executive Summary

The purpose of this report is to provide input from the agricultural industry to the University of Florida, Institute of Food and Agricultural Sciences (IFAS) and state policy makers on the structure and future of the UF/IFAS. In our view IFAS is at a crossroads. The question we are attempting to answer is: "Will IFAS become one of the top five land grant agricultural institutions, or will it slide into mediocrity?"

The recommendations and timelines given in this report are designed to move IFAS into the top five agriculturally focused land grant institutions nationally.

The process used for this report includes personal interviews with farmers and IFAS faculty and administration, a written audit of IFAS by other agricultural groups through the Florida Agricultural Council, and a group of producers representing the Florida animal production industry.

As a general farm organization, Florida Farm Bureau chose to look only at the agricultural component of IFAS. While we recognize the varied clientele base for IFAS, our concern and focus is on the agricultural sector and in strengthening that sector.

This report looks back over one hundred forty years in the development of the land grant system. Originally, the Federal Government provided land to states to establish schools to teach agricultural sciences, mechanical arts, and military training. The intent was to extend public education to meet the needs of the agricultural and industrial population. This truly provided the opportunity for public education of the masses.

The University of Florida is a chartered land grant university with the Institute of Food and Agricultural Sciences (IFAS) serving the agricultural component of the land grant mission. Within IFAS, the College of Agriculture and Life Sciences meets the teaching role, the Florida Agricultural Experiment Stations are the research components, and finally, the Florida Cooperative Extension Service. These units interface to form a statewide and nationwide network of land grant institutions that provide agricultural knowledge and expertise.

The mission of IFAS is to develop knowledge in agriculture, human, and natural resources and to make that knowledge accessible to sustain and enhance the quality of human life.

The College of Agriculture and Life Sciences (CALS) is one of the nation's larger teaching programs within the land grant system. CALS has an undergraduate enrollment of about 2,900 and over 850 graduate students on the main campus and six off-campus sites. The teaching program is formula-funded, the same as other teaching programs within the state university system.

The Florida Agricultural Experiment Station (FAES) fulfills the IFAS agricultural research mission. The Experiment Station is actually a network of 13 administrative centers with 20 sites across Florida. There are more than 700 active research projects across the state. There is no formula funding within the state university system for this research component.

The Florida Cooperative Extension Service (FCES) provides educational programs that are cooperatively administered with IFAS, USDA, Florida A&M University, the state's 67 counties, and the Seminole Tribe. Each of the state's counties is served by County extension agents who provide information and educational programs that extend the research conducted through the FAES to farmers, ranchers, and

others. This provides the third leg of the land grant stool. The county faculty may be paid jointly by the state and county or totally by the county for specific programmatic needs. Often a particular program may have only federal or county dollars earmarked for it, and that funding can only be used for that specific program. There is no funding mechanism in the state university system to allocate funding to faculty with contact hours with non-enrolled or informal students.

As a land grant institution, UF/IFAS has several streams of funding and funding sources that are a complex mix of state, local, federal and private funds. The state provides the largest portion of the funding for IFAS. There is no apparent way of calculating what the Extension or Research budget will be in any given year. The IFAS budget, over the last ten years, appears flat to actually decreasing when inflation is considered. In 2001 and 2002 the Florida Legislature made cuts that, when coupled with the flat budget in the previous ten years, forced a major contraction. To fully implement the reduced funding, the administration, faculty and support positions and facilities have undergone consolidation with a downsizing of 325 positions.

Florida is a unique and diverse agricultural state. The Sunshine State, with over 280 different crops being produced, is second only to California in agricultural diversity. This diversity assures that agriculture provides stability to Florida's economy. We consistently rank in the top 10 states nationally with farm cash receipts. Our farmers by and large do not benefit from Federal Farm Programs that raise other states' farm cash receipts. Florida's 44,000 farms are primarily family farms that manage more than 10 million acres of land. This, combined with commercial forestland, accounts for about 75 percent of the state's 35 million acres that are managed as some form of agricultural and natural resource enterprise.

Farmers operate in a classic supply and demand market and are more price-takers than price-makers. Even though agriculture has a $54 billion impact on Florida's economy, there are sectors that have not prospered. In general, Florida's farmers were not participants in the economic boom of the 1990's. The economic pressure on our farmers has caused them to turn to IFAS for help in building profitability back into the agricultural operations. IFAS serves as the research and development arm for this diverse and broad-based industry. Small, limited resources and new farmers just establishing a farm learn about and can utilize the same technology that larger farmers utilize. This access to research and technology transfer through the extension function is because of IFAS and its land grant mission.

The Task Force surfaced and identified twenty findings from growers. These findings were very specific and covered areas from the greater University of Florida policies and processes to industry perspectives and legislative actions and activities.

A list of recommendations were developed that addressed each of the findings. These recommendations are:

1. We recommend that several agricultural representatives participate with the External Review Team to provide input from the agricultural industry on the structure of the Florida Cooperative Extension Service (FCES).
   The administration should consider designating those County extension agents with agricultural responsibility as "County agricultural extension agents".
   We recommend that multi-county or regional agricultural agents be considered as options to County agricultural extension agents.
   There should be a system of accountability established that allows the affected clientele to have input on the evaluation of these faculty members.
2. We recommend that the Florida Legislature support the IFAS 2003 proposed budget initiative for serving and protecting Florida's agricultural and natural resources economic value.

3. We recommend that the IFAS administration work with the greater University of Florida community to develop alternatives to or broader opportunities for publication for those faculty who have a pure technology transfer role to receive tenure and promotion.
We also recommend that the IFAS administration hold faculty accountable in their annual evaluations and assure they are productive members of the IFAS faculty. For those faculty members who share research appointments with extension or teaching, we recommend they receive the necessary help and guidance so their research is productive enough to provide them ample opportunity for publication and consequently promotion.

4. We recommend that a basic and applied research fund be established within IFAS that would provide faculty the opportunity to apply, through a competitive grant process, for funding to do basic and applied research that may impact Florida agriculture.

5. We recommend that the Florida Legislature approve and IFAS establish a quick response program ($100,000 annually) to address new and emerging issues that affect the agricultural industry and the State.

6. We recommend that the agricultural grower groups that provide IFAS funding for research hold the researchers and IFAS accountable for the quality of research done.
We also recommend there not be any administrative fees levied against grower group grants.

7. We recommend that IFAS continue to administratively focus on the entire system as a consolidated statewide entity.

8. We recommend that the IFAS administration study possible incentives for non-tenure track faculty positions.

9. We recommend that IFAS prioritize the maintenance needs of their statewide facilities and develop a budget to meet those needs as well as their operational cost needs.
We also urge the University of Florida administration to include in the budget deferred maintenance and operation costs of the off-campus facilities either in the overall budget or in the IFAS budget.

10. We recommend the Florida Legislature approve the 2003 IFAS budget request of $1.4 million to match the approximate $1.6 million of county funding to hire county and multi-county faculty to fill vacancies of the county Extension faculty.

11. We recommend that UF, IFAS and the Legislature work in concert to restore funding necessary to reverse the downward trend.
We recommend that the IFAS administration assure that agricultural education, research and extension continue to be the focus of IFAS and restore the faith of the agricultural community in UF/IFAS as an effective agricultural knowledge resource for Florida.
We recommend that over the long term the Legislature adequately fund IFAS.

12. We recommend that the Legislature restore faculty funding to the same levels they were prior to the DROP program.
We also recommend that the IFAS administration develop a process where the agricultural industry has input into and prioritization of those replacement and new positions.

13. We recommend that the Legislature identify and comprehensively study those impediments that restrict the management ability of the heads of the agencies and universities in Florida.
We also recommend that appropriate legislation be drafted and passed that would allow the UF/IFAS to act and respond in a similar manner to budget matters as private enterprise does.

14. We recommend that the University of Florida include all three entities (CALS, FCES, and FAES) of IFAS in a unified budget to the Legislature.

We recommend that the Legislature further clarify the statute to mean that the IFAS budget includes all three entities.

15. We recommend that IFAS develop a new strategic planning process with the agricultural community. This process should focus on production agriculture to ensure its place in the Florida landscape and economy.

16. We recommend that IFAS faculty speak out on the positive aspects of agriculture without becoming advocates.

17. We recommend that a formula be developed in conjunction with IFAS and the Legislature that would recognize and account for the Florida Cooperative Extension Service's (FCES) educational role to Florida agriculture and their service in the non-traditional classroom.
We recommend and urge the Legislature to mandate that this formula be implemented and used in the budgeting process for IFAS and the University of Florida.
We also need to develop a formula to fund knowledge development through research thereby stabilizing funding for the Florida experiment station.

18. We recommend that IFAS develop budgets for regional and statewide initiatives and provide them to the Legislature for funding approval.
The Legislature should provide for the agricultural industry's input and hold IFAS accountable through reports back to the Senate and House Agriculture Committees and other committees as deemed appropriate.

19. We recommend that a Florida Center for Agricultural Profitability and Sustainability (F-CAPS) be established within IFAS with the appropriate funding to be determined by IFAS and approved by the Legislature.
This funding could be a one-time grant to establish and maintain the Center, or it could be funded through the annual budget process.

20. We urge the UF/IFAS to continue developing educational partnerships with other educational institutions within Florida that will result in expanded agricultural degree programs being available to students across the state.
We recommend that the Florida Legislature fund the Teaching Partnerships Initiative for $1.6 million in the 2003 UF/IFAS budget request for expanded teaching programs.

Legislative Recommendations:

Short-term legislative needs (1-2 years)

- Approve the 2003 budget request for IFAS as submitted by the University of Florida and the three initiatives: Serving and Protecting Florida's Agriculture and Natural Resources Economic Value - $3.9 million, Local Extension Matching Initiative - $1.4 million and Teaching Partnerships - $1.6 million.
- Clarify existing law to mean that all three components of IFAS (teaching, research and extension) should be in the IFAS budget line for the University of Florida.
- Have a study done of the impediments to effectively implement budget cuts within the University system.
- Maintain Legislative oversight by having IFAS give an annual report to joint agriculture and education committees.

Mid-term legislative needs (3-6 years)

- Develop legislation that would allow a research fund of up to $1 million to be established within IFAS. These dollars would fund research on critical and emerging issues in Florida. The IFAS vice-president, the three deans and three agricultural industry representatives would approve the competitive grants to the IFAS faculty.
- Develop legislation that would allow the IFAS administration to have a fund ($100,000 annually) that they could use to redirect faculty to new and emerging issues and in effect buy back the faculty members' time from the grants that they are working on.
- Develop a funding formula for Extension that takes into consideration clientele contact, state population and other considerations.
- Assure that funds realized from the IFAS DROP program stays with IFAS.
- Develop a legislative package that will address the deferred maintenance at off-campus facilities.
- Take action on impediments study so that IFAS can function more like the private sector.

Long-Term Legislative Needs (7-10 years)

- Legislative oversight of funding to see that it follows the trend lines for other educational institutions.
- Provide funding for future educational partnerships.
- Funding will be needed for specific industry requested initiatives.

This report also developed a plan of action for IFAS to implement to show the Legislature, IFAS and the grower community not only what our plan is, but also the implementation of that plan.

FAIR's Short Term Plan for IFAS With a 1-2 Year Horizon

- The agricultural industry will participate with the IFAS Extension External Review scheduled for late 2002 or early 2003. The IFAS Vice-President and the Dean of Extension should study the recommendations and implement those appropriate changes that modernize and update the Florida Cooperative Extension Service.
- The IFAS Vice-President and the Dean of Research will make an in-depth inventory of off-campus facilities that need maintenance. They will develop a multi-year plan to bring all facilities up to standard and present that plan to the Florida Legislature.
- The IFAS Vice-President will prepare a report to be presented to the President of the University of Florida, the University of Florida Board of Trustees and the Florida Legislature detailing the operational areas that are financially provided for on campus but not at the off-campus facilities.
- The Vice-President of IFAS and the Deans of Research, Extension and the College of Agriculture and Life Sciences will identify additional administrative areas that can be consolidated and begin that consolidation. They are urged to look past simply consolidating positions, but also look at job functions, educational needs and research needs.
- During this administrative consolidation all off-campus research and education centers will be maintained and research and extension activities will continue at those sites.
- The Vice-President of IFAS will establish a Florida Center for Agricultural Profitability and Sustainability (F-CAPS) that will serve all sectors of the Florida agricultural industry.
- The IFAS Vice-President will establish a statewide industry advisory committee that will provide input on the direction of IFAS and the implementation of this plan.

- In consultation with the newly formed advisory committee the IFAS administration will submit a complete budget for IFAS through the University of Florida to the Florida Legislature.
- The IFAS administration will fill faculty positions that county governments will cost-share with legislative approval.
- The educational partnership with Hillsborough Community College will be completed.

FAIR's Mid Term Plan for IFAS With a 3-6 Year Horizon

- The major vacancies created by the DROP program should be finalized and the IFAS administration, with industry input, should complete evaluations of those positions and fill those that are justified. Those positions that are not justified as necessary or critical should be considered as new positions that will meet industry demands for new research and extension areas.
- Other new and open positions that meet industry needs will be filled after legislative approval of the budget.
- The IFAS administration will implement their plan to address the deferred maintenance for the off-campus facilities. They will also develop a plan for new and needed remodeling to make them effective research and demonstration facilities and capable of using new technology.
- In an effort to provide guidance and certainty to the budgetary process for the IFAS administration, the IFAS faculty, and the Florida Legislature, a funding formula for the extension function will be developed. This formula should be based on contact hours, state population growth and other areas that may be pertinent. A funding formula for research should also be considered.
- The IFAS vice-president will develop a plan to establish a dedicated fund of up to $1 million to be used in a competitive grant process by the faculty. This process will address emerging and other issues within the state that the faculty might not get external funding for, or to enhance and leverage external funding.
- The IFAS Vice-President will develop a quick response mechanism or process that provides for and mandates that IFAS faculty be focused on new and emerging issues. This process will allow for up to $100,000 annually to be used to buy the faculty time away from their grants and allow them to refocus on these new and emerging issues.
- The IFAS administration, with the greater university community, will have resolved the issues of tenure and promotion for extension faculty.
- The IFAS administration will provide a report to Florida Farm Bureau Federation and other interested agricultural organizations concerning the use of non-tenure tracks for faculty.
- The IFAS administration will develop a strategic plan that focuses on production agriculture.
- The IFAS administration, while responsible for an academic institution, will use the private sector as a model for making management decisions when possible.
- The IFAS administration will provide an annual report to the Florida Legislature that addresses their service to the State of Florida and its agricultural industry.
- The IFAS administration will maintain teaching facilities and experiences so students are prepared to work and succeed in the agricultural industry. Even if facilities or programs are consolidated or downsized, the quality of education will not be compromised.

- The IFAS Administration will develop an in-house training program for faculty interested in moving to administrative roles within IFAS.

FAIR's Long Term Plan for IFAS With a 7-10 Year Horizon

- While the faculty will still rely on external funding, there will be internal funding that will keep the faculty responsive to new and emerging issues as well as critical state issues.
- The administration for this statewide resource will be trained in administration and be responsible for multiple administrative tasks and roles. When evaluated against similar institutions the IFAS administration will be in the top 10 percent, both in effectiveness and with the lowest ratio of administrators to faculty.
- IFAS will be responsive to the agricultural industry and its clientele. This will be evidenced by its graduates, the quality of research, and the variety of educational programs provided to the clientele.
- The Extension model will be altered to more accurately reflect the changing population, the changing agricultural industry and the changing needs of the agricultural community.
- With a stable funding source the IFAS faculty must not only be accountable but also must be productive. The productivity of the faculty, whether it is published research, classroom contact hours or extension contacts, will lend to its accountability.

The IFAS administration will present an annual report to the Florida Legislature and the agricultural community.

- The IFAS administration will continue to evaluate open faculty positions and fill only those that are justified.
- Off-campus facilities will continue to be evaluated for their productivity. If that productivity declines substantially, or if the focus of the Center has changed because of shifts in the industry, the IFAS administration will consult with the agricultural community. If they reach agreement, then the Center may be consolidated or closed. Without that industry approval the Center will continue as a research farm and as a demonstration facility even without faculty housed on-site.
- Form additional teaching partnerships across the state and with other land grants as opportunities arise.
- Maintain teaching facilities.

The full report can be downloaded at http://pdec.ifas.ufl.edu/FAIR.doc

d. REPLY TO THE FAIR REPORT

FLORIDA AGICULTURAL INDUSTRY REPORT ON THE UNIVERISITY OF FLORIDA INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES (IFAS)
(The FAIR Report)

Introduction

The subject review and report was an effort led by the Florida Farm Bureau Board. Dr. Mike Martin, Vice President for Agriculture and Natural Resources, appointed an Internal Task Force[2] to review the findings and recommendations. The Task Force surfaced and identified twenty general findings from agricultural producers and other related industry groups. The final report was issued in December of 2002. The findings were specific and covered areas from the greater University of Florida policies and processes to industry perspectives and legislative actions and activities. IFAS greatly appreciates the effort and recommendations that were developed and established an internal task force to address the short- and long-term actions or changes which needed to occur in response to the FAIR report.

A list of general recommendations that addressed each of the findings was presented in the Executive Summary to the report (copy attached). These recommendations and the IFAS interim response to each are provided below.

Recommendations and response

1. **We recommend that several agricultural representatives participate with the External Review Team to provide input from the agricultural industry on the structure of the Florida Cooperative Extension Service (FCES).**

   The administration should consider designating those County extension agents with agricultural responsibility as "County agricultural extension agents".

   We recommend that multi-county or regional agricultural agents be considered as options to County agricultural extension agents.

   There should be a system of accountability established that allows the affected clientele to have input on the evaluation of these faculty members.

   Response

   This recommendation is basically complete. The review was conducted February 5-7, 2003. Numerous agriculture and natural resources industry representatives met with the Extension External Review team and also participated in a series of listening sessions conducted by the Dean for Extension.

[2] Members: J. C. Joyce, Task Force Chair, L.R. Arrington, W.F. Brown, R. Hochmuth, E.J. Luzar, T.A. Nell, J.E. Rechcigl, P. Vergot

As a result of these meetings and the other recommendations from the FAIR report, IFAS is implementing changes to the Extension staffing model to establish multi-county or regional county agent positions where appropriate and to strengthen the linkage with the research faculty at the Research and Education Centers (RECs) and campus-based faculty. Since the review, five new county positions have been advertised in a manner to attract more highly trained and experienced county faculty with regional responsibilities. Additionally, two existing multi-county faculty have been given more regional responsibilities and status. All current and future vacancies will be analyzed to determine which should be shifted to regional positions. Some county/state faculty positions may be converted to Extension Scientist positions with the expressed purpose of supporting variety trials, pesticide trials and on-farm demonstrations.

IFAS is developing a framework for clientele input into customer service for the entire organization.

2. **We recommend that the Florida Legislature support the IFAS 2003 proposed budget initiative for serving and protecting Florida's agricultural and natural resources economic value.**

Response

The FAIR report was submitted to the Florida Legislative Education Appropriation committees by Mr. Pat Cockrell as a part of the IFAS budget presentation and was well received. Unfortunately, IFAS received an additional $2.5 million base budget reduction, but this was much less than the $8.4 million reduction proposed in the Governor's budget. For the 2004-05 IFAS Legislative Budget Request, the University of Florida Board of Trustees, Universities' Board of Governors, and the Florida Board of Education have recommended a $4.24 million increase in the IFAS budget specifically for research and extension programs in programs related to water, sustaining and enhancing Florida's agricultural and natural resources industries, and food safety, security and nutrition. An additional $500,000 was requested to enhance off-campus teaching programs located at seven of the IFAS RECs. The current priority is to ensure that the Governor includes the request in his 2004 budget submission to the Florida Legislature. IFAS and Farm Bureau clientele will play a major role in convincing legislative leaders to endorse this request.

3. **We recommend that the IFAS administration work with the greater University of Florida community to develop alternatives to or broaden opportunities for publication for those faculty who have a pure technology transfer role to receive tenure and promotion.**

We also recommend that the IFAS administration hold faculty accountable in their annual evaluations and assure they are productive members of the IFAS faculty. For those faculty members who share research appointments with extension or teaching, we recommend they receive the necessary help and guidance so their research is productive enough to provide them ample opportunity for publication and consequently promotion.

Response

The UF/IFAS administration embraces high levels of academic achievement and scholarship in teaching, research and extension and promotes the establishment of faculty programs that lead to local, national and international recognition. We agree that Tenure and Promotion criteria should reflect the importance and uniqueness of the service aspect of our mission and recognize related accomplishments as equitably as other areas of academic endeavor. At the same time, an

emphasis on innovation and practicality should not be neglected. Criteria will be reviewed regularly to determine additional adjustments that should be made.

Faculty are recognized for publishing in popular magazines and trade journals. A new publication category "Reviewed Extension Publication" to the tenure and promotion document has been added to the University's tenure and promotion criteria to address this request. This should raise the stature and importance of these peer-reviewed documents and provide the proper faculty credit for this effort. Those faculty with formal extension programs must define their objectives in the "Plan of Work" with measurable accomplishments that reflect the impact of their programs on Florida citizens. Requirements for advancement vary considerably among the academic units at the University of Florida. The service mission of IFAS is frequently misunderstood by the University Tenure and Promotion Committee. Since the composition of the Committee changes frequently, there is a constant need for reinforcing the IFAS message. Consequently, we recommend that each division (Liberal Arts and Sciences, Medicine, Engineering and IFAS) be granted the obligation and right to develop their own tenure and promotion guidelines and that the decisions for tenure and promotion rest within the individual colleges.

The professional and academic productivity of IFAS faculty is of paramount importance to the IFAS Administration. Deficiencies in this area have been recognized and continually are being addressed. The UF/IFAS Faculty Evaluation Forms were revised in 2002 and include more emphasis on accountability, clientele interaction and service. In addition, IFAS has recently implemented the "Sustained Performance Review," which was developed specifically to address the issue of "non-productive faculty". This program provides frequent counseling and a framework of measurable goals to enhance faculty productivity. If however, the faculty member does not show measurable improvement, the program allows for dismissal regardless of tenure status of the faculty member, and that process has been implemented.

4. **We recommend that a basic and applied research fund be established within IFAS that would provide faculty the opportunity to apply, through a competitive grant process, for funding to do basic and applied research that may impact Florida agriculture.**

   Response

   Florida Farm Bureau is currently working this issue with the Legislature and the Commissioner of Agriculture. We endorse this initiative and view it similarly to the Citrus Production Box Tax funds in the way that they are administered, i.e. priorities are set by a panel of agricultural and natural resource clientele and faculty respond to these priorities and report results back to the panel. Such a program will ensure that IFAS scientists are addressing priority issues and provide for accountability to stakeholders. The funds would provide operational funds to address industry identified priorities. IFAS would provide the faculty and staff support from existing funds.

5. **We recommend that the Florida Legislature approve and IFAS establish a quick response program ($100,000 annually) to address new and emerging issues that affect the agricultural industry and the State.**

   Response

   IFAS has established such a fund as a part of its 2003-04 and future operating budget. The funds will be used as issues arise. If funds allocated for this purpose are not spent by May of a given

fiscal year, they will be directed to critical deferred maintenance needs.

6. **We recommend that the agricultural grower groups that provide IFAS funding for research hold the researchers and IFAS accountable for the quality of research done.**

   We also recommend there not be any administrative fees levied against grower group grants.

   Response

   Several commodity/clientele groups provide much needed and highly appreciated funds to help drive the operational needs of the faculty's teaching, research and extension programs. State and federal funding provide infrastructure support (i.e. faculty and technician salary and fringe benefits, basic infrastructure) but provide the faculty limited discretionary operational dollars. These commodity/clientele support programs provide an excellent leverage to state and federal support that provides the faculty with needed operational dollars to drive their teaching, research and extension programs in direct response to clientele needs. Examples of these commodity/clientele programs include the citrus production funding order, dairy milk check-off, peanut growers check-off, soybean grower's check-off, tobacco grower's check-off, Florida Nurserymen and Growers Association research fund, Florida Tomato Committee, Florida Turfgrass Association, Caladium growers and Florida Foundation Seed Producers, Inc. Commodity/clientele groups also aid UF/IFAS funding through interactions with state and federal legislators seeking funding for specific programs.

   Most of these commodity/clientele support programs have a producer advisory board that solicits a formal request for proposals, evaluates and makes decisions on which proposals are funded and receives progress and final reports from participating faculty. Other programs are less formal, but all have a mechanism for obtaining clientele input for determining teaching, research and extension priorities. These programs not only provide much needed funding to help drive faculty programs but also provide a mechanism for clientele interaction and discussion of needs and priorities for the direction of UF/IFAS teaching, research and extension programs.

   UF/IFAS will develop a summary of all commodity/clientele support programs including funding amounts over the past several years and make this available to Florida Farm Bureau, if desired.

   The issue of indirect cost return warrants further discussion. Indirect costs returned from grant programs are used for infrastructure support including facility repair and maintenance and to provide faculty support services through IFAS-wide publications, business and grants offices. There may be an opportunity to return a larger portion of indirect costs to provide infrastructure support to the UF/IFAS facilities that are directly involved in the commodity/clientele support program.

7. **We recommend that IFAS continue to administratively focus on the entire system as a consolidated statewide entity.**

   Response

   Over the past decade IFAS has consolidated and/or closed numerous RECs, academic departments and administrative offices. Most recently, plans and funding was secured to sell the Bradenton REC and consolidate it with the Dover REC at a new regional site at Balm, Florida. This will provide a state-of-the-art facility that will be both more efficient and effective at meeting regional and statewide research, teaching and extension needs of our clientele. IFAS has

also consolidated administrative functions for several RECs or departments under a single administrator, notable examples include consolidation of three animal science departments under one departmental chair of Animal Sciences and consolidation under one REC director of the facilities of Live Oak, Marianna, and Quincy with the closure/divestiture of Chipley, Bountstown and Monticello facilities. IFAS will continue to look for and take advantage of consolidation and cost saving opportunities.

8. **We recommend that the IFAS administration study possible incentives for non-tenure track faculty positions.**

   Response

   IFAS has studied this recommendation in light of recommendation number 3 above. IFAS is moving to hire non-tenure accruing faculty to fill certain positions that in the past have been reserved for tenured faculty. Numerous positions have recently been filled following this model by hiring faculty to non-tenured, multi-year contracts to fill appropriate research, teaching and extension program needs. Examples include hiring full- and part-time Lecturers, Doctors of Plant Medicine for plant pest diagnostic functions, Extension Scientists, and multi-county specialists for higher-level extension and research functions. IFAS will continue to look for appropriate opportunities.

9. **We recommend that IFAS prioritize the maintenance needs of their statewide facilities and develop a budget to meet those needs as well as their operational cost needs.**

   We also urge the University of Florida administration to include in the budget deferred maintenance and operation costs of the off-campus facilities either in the overall budget or in the IFAS budget.

   Response

   IFAS has prioritized its most severe deferred maintenance needs and is using available maintenance/renovation funds to address the most serious needs.

   IFAS submitted a legislative budget request item to the UF administration to adjust the operation and maintenance for all IFAS buildings constructed prior to 1999. These buildings are currently funded at approximately 50% of similar space at other public state universities. This under funding requires IFAS to divert appropriately $4.5 million annually from programs in order to meet operational and maintenance needs. IFAS is also working with the Florida Board of Governors (FBOG) to change the formula under authority of the FBOG without specific legislative funding.

10. **We recommend the Florida Legislature approve the 2003 IFAS budget request of $1.4 million to match the approximate $1.6 million of county funding to hire county and multi-county faculty to fill vacancies of the county Extension faculty.**

    Response

    This request was not funded by the Legislature. However, using funds generated from vacancies and prioritization of programs, IFAS did fill 22 of 48 vacant county faculty positions. The 26 remaining positions were requested and approved as part of the $995,000 legislative budget request by the University of Florida Board of Trustees.

11. **We recommend that UF, IFAS and the Legislature work in concert to restore funding necessary to reverse the downward trend.**

    We recommend that the IFAS administration assure that agricultural education, research and extension continue to be the focus of IFAS and restore the faith of the agricultural community in UF/IFAS as an effective agricultural knowledge resource for Florida.

    We recommend that over the long term the Legislature adequately fund IFAS.

    Response

    IFAS has lost $12.1 million of its base General Revenue (sales tax revenue) over the past three legislative sessions. This has meant a loss of over 140 faculty positions and corresponding technical and programmatic support. IFAS cannot sustain productivity and customer service if this trend continues. The fact that we have survived this situation without any more draconian measures than were implemented is a credit to the resourcefulness of the faculty and unit level administrators.

    Clientele must feel ownership in IFAS as a resource and key to their economic and mission success that should then turn into legislative pressure by clientele for funding trend reversal. Becoming more customer -service oriented is an absolute key to this. We must engage clientele who must engage their legislative leaders to reverse this trend in order to support programs that are essential to sustainability and enhancement of Florida's agricultural and natural resource industries. A marketing/customer service focus plan is being developed to enhance IFAS identity and service focus.

12. **We recommend that the Legislature restore faculty funding to the same levels they were prior to the DROP program.**

    We also recommend that the IFAS administration develop a process where the agricultural industry has input into and prioritization of those replacement and new positions.

    Response

    IFAS, of course, concurs. The $2.5 million budget reduction last session resulted in the inability to fill 28 faculty positions and support funds vacant due to the DROP program. IFAS must depend upon its clientele to engage the legislative leaders to reverse this trend.

    As indicated in recommendation 11, IFAS is evaluating and implementing processes to increase clientele input into program priorities. Engagement of expanded regional and local advisory groups is one method being pursued as a source of input into this process. Given the current budget climate, it must be recognized that within a given year not all requests can be met and IFAS central administration must make some hard prioritization decisions.

13. **We recommend that the Legislature identify and comprehensively study those impediments that restrict the management ability of the heads of the agencies and universities in Florida.**

    We also recommend that appropriate legislation be drafted and passed that would allow the UF/IFAS to act and respond in a similar manner to budget matters as private enterprise does.

    Response

The devolution of authority to the Board of Trustees of each state university and the corresponding change in status of the universities from state agency status to "body corporate" should allow some flexibility to address this recommendation.

IFAS is not a private enterprise and cannot make the same operating decisions that the private sector makes during economic down turns.

14. **We recommend that the University of Florida include all three entities (CALS, FCES, and FAES) of IFAS in a unified budget to the Legislature.**

    We recommend that the Legislature further clarify the statute to mean that the IFAS budget includes all three entities.

    Response

    This is a discussion that must occur between the UF and IFAS administration, with a common request to the legislature. There are numerous pros and cons to this issue and it must be carefully analyzed prior to pursuing.

    IFAS feels that educational opportunities are needed with the legislature in an attempt to stress the point that IFAS is a unique entity within the state university system, with a specialized research, extension and teaching mission that has a direct impact on the economic development of Florida. Such opportunities and efforts will have benefit in addressing the underlying issue associated with this recommendation.

15. **We recommend that IFAS develop a new strategic planning process with the agricultural community. This process should focus on production agriculture to ensure its place in the Florida landscape and economy.**

    Over the past several years, IFAS has conducted a series of strategic planning, external and internal reviews, formal and informal listening sessions and is planning for a commercial agriculture leader forum to better focus our programs on the needs of our commercial agriculture clientele. The Extension long range planning effort has been reviewed and endorsed by agriculture and natural resource industry leaders.

16. **We recommend that IFAS faculty speak out on the positive aspects of agriculture without becoming advocates.**

    Response

    Various projects have begun to identify the value (qualitative and quantitative) of agricultural and natural resource industries to Florida. Faculty will be encouraged to use proper forums to present data on value of both segments and the entire industry to the state's social, economic and environmental health.

17. **We recommend that a formula be developed in conjunction with IFAS and the Legislature that would recognize and account for the Florida Cooperative Extension Service's (FCES) educational role to Florida agriculture and their service in the non-traditional classroom.**

    We recommend and urge the Legislature to mandate that this formula be implemented and used in the budgeting process for IFAS and the University of Florida.

We also need to develop a formula to fund knowledge development through research thereby stabilizing funding for the Florida Experiment Station.

Response

Currently the IFAS teaching program under the College for Agricultural and Life Sciences is "formula funded" in that its funding is calculated based upon the number of undergraduate and graduate students taught per semester. Recent reductions to the teaching budgets have been offset by legislatively approved tuition increases. The IFAS research and extension budgets are not "formula funded" and, thus, do not benefit from tuition increases. Three other budget entities in the state university system have a similar problem and resolution of this inequity has been made a priority by all the other universities affected.

Clientele are encouraged to convince the legislature for the need for such an approach.

IFAS developed such a formula several years ago but it did not receive adequate support or understanding. We suspect that the reason was that the timing was not appropriate and the formula was too complicated. IFAS has formed a task force to develop a more easily understood and saleable formula. A legislative mandate to develop such a performance-based formula will greatly assist in acceptance of the resulting formula.

18. **We recommend that IFAS develop budgets for regional and statewide initiatives and provide them to the Legislature for funding approval.**

    The Legislature should provide for the agricultural industry's input and hold IFAS accountable through reports back to the Senate and House Agriculture Committees and other committees as deemed appropriate.

    Response

    Based on input received from our clientele, the 2004-05-budget request was developed in such a manner. We are attempting to schedule as many presentations before the appropriate legislative committees and individual legislators as possible. Florida Farm Bureau's participation in such presentations during the 2003 legislative session was greatly appreciated.

19. **We recommend that a Florida Center for Agricultural Profitability and Sustainability (F-CAPS) be established within IFAS with the appropriate funding to be determined by IFAS and approved by the Legislature.**

    This funding could be a one-time grant to establish and maintain the Center, or it could be funded through the annual budget process.

    Response

    IFAS is evaluating the feasibility and funding potential for such an initiative.

20. **We urge the UF/IFAS to continue developing educational partnerships with other educational institutions within Florida that will result in expanded agricultural degree programs being available to students across the state.**

    We recommend that the Florida Legislature fund the Teaching Partnerships Initiative for $1.6 million in the 2003 UF/IFAS budget request for expanded teaching programs.

    Response

    IFAS is aggressively pursuing this approach and currently has seven (7) such partnerships

through the state. This approach allows IFAS to extend teaching/certificate programs to non-traditional, place bound students. Sites include Apopka, Ft. Pierce, Ft. Lauderdale, Homestead, Ft. Myers, Jay/Milton, and most recently Hillsborough Community College, Plant City campus. IFAS is also studying the feasibility of regional detailed market surveys of both students and potential employers around our regional RECs to determine the best mix of curriculum (degree and non-degree producing.)

e. EXTERNAL REVIEW

2003 Extension Comprehensive Review
Final Report
March, 2003

This report is our response to your request for an outside review of IFAS Extension at the University of Florida. Each member of our review team wishes to congratulate and thank you and your entire IFAS organization for the outstanding preparation and extra effort it took to make this a meaningful endeavor. In addition, each of us thanks you for your warm and caring hospitality.

The University of Florida IFAS Extension is a quality organization with a history of exceptional educational programming. Today, you find yourself facing significant changes in a variety of areas:

Financial challenges that may persist for an unknown period of time.
Rapidly changing state demographics ---an increasing and diverse population that is bi-modal in nature --- retired part-time residents and young families.
Gaps in the economic status of many diverse groups within the state.
A high rate of poverty closely correlated to detrimental health and educational problems.
A high school dropout rate as high as 50 percent, in some communities.
A rapidly changing agricultural industry that has historically been your primary educational clientele and political support.
Increasing political influence in the state shifting to South Florida.
Environmental concerns related to land and water.
An aging faculty with a large proportion retiring in the next 5 to 7 years, accelerated by a state incentive retirement program called DROP.
Changes in both the governance of the State of Florida and the University of Florida.

Extension is at a crossroads. Over the next 10 years, you will need to make important decisions about where Extension wants to lead this exceptional jewel of the university. It is in this context that we offer our observations, judgement and advice. Please realize that our crystal ball is no better than yours, that we bring a perspective based on our wide range of experiences. In addition, our distance from the day to day situation you encounter locally are both an advantage and a disadvantage.

We have listed below some important values that we perceive to be implied by the IFAS administration. We know you are currently working on articulating your vision, mission and values, and we suggest you complete that process as soon as possible. Each of us has found that this process of "stepping back" and refining who we are and refining our goals has been a very helpful tool for making decisions within our institutions.

Implied values:

To provide a flexible administrative platform to apply research and knowledge to address local issues and concerns, thus meeting the land grant educational mission in Florida.

To establish successful partnerships with county, state, and federal governments and with non-profit organizations and private industry by sharing interests, responsibility, resources and recognition.

To broaden programming and political and monetary support to reflect the changing demographics of the Florida population and your local, state and federal elected officials.

To expand educational programs for urban and suburban clientele.

To seek diversity of faculty and clientele and welcome differences in people, programs and partnerships.

To demonstrate the highest standards for program quality and recognition.

The review team organized its report in response to the questions stated on page 7 of the review syllabus.

What are the strengths and weaknesses of the organizational structure of FCES for supporting clientele needs?

Some of the most predominant strengths are listed below:

Very competent, innovative and dedicated faculty and staff at the state, district and county levels.

Excellent network of Extension educators located at the campus, district, Research Education Centers (REC) and county level.

A good working and programming relationship between 1890 Cooperative Extension program and the University of Florida Cooperative Extension.

Good variety of subject matter specialists in agriculture --- however, several positions currently are vacant.

A variety of educational models are either in place or being considered. The energy program and the Sea Grant extension programs are strong examples.

Joint appointments between extension and research add to the success of both components of IFAS.

There are some weaknesses as well. The most predominant weaknesses are listed below:

The structure appears to impede a natural course of communications between administration, campus specialists, district, Research and Education Centers (RECs) and county faculty. The expectations, rules, responsibilities and avenues of communication between these groups are not well defined or understood in the agency. This was also outlined in the external review of the IFAS REC's.

The roles of middle management (program leaders, district directors, REC directors, and county directors) are not well defined or understood in the organization.

The expectations and span of responsibility for district directors is too broad and unrealistic.

The absence of a memorandum of understanding between IFAS Extension and the county government is not in place for all counties. This has liability issues and appears to be adding to confusion as to role, responsibility and accountability of county faculty.

Specialist support for youth development, family and consumer science and natural resources are inadequate to sustain long term educational programming.

A comprehensive long range staffing plan does not appear evident.

Support for program planning and development, distance education, professional development and evaluation is not well defined. Considerable resources are available, but a clear focus and coordination on high priority educational programming and internal professional development was not evident.

The quality of communications shared with a variety of "advisory groups" appears to be adding to the confusion and lack of clarity of information moving in each direction within IFAS concerning both research and extension programs.

The fact that IFAS has RECs is both positive and negative. With respect to agriculture, RECs seem to effectively move research closer to the clientele and are seen by the majority of agricultural agents and agricultural clientele as positive. However, with respect to specialists and agents working in program areas other than agriculture, RECs seem to play a neutral to negative role. The negative aspect usually arises over allocation of funding and staffing resources. RECs historically focus on agriculture. Broadening their mission seems highly unlikely. It appears that the relationship and expectations of RECs and county offices needs to be clarified and communicated both internally and externally.

2. Does IFAS Extension have the correct balance of faculty to support clientele needs?

Defining the "clientele" is a critical part of any response to this question. In general, clientele were defined by administration and faculty in a traditional manner for three of the program areas: agriculture, family consumer science and 4-H. Aquatic, coastal, aquaculture, natural resources and energy were much broader and diverse in nature. Horticulture was presented in a variety of ways, for example, commercial horticulture was defined by commodity groups, and urban horticulture included Master Gardeners and the Florida Yard and Neighborhoods program focused on a broad base of clientele. It was rare to hear administrators or specialists consider county elected and appointed officials as clientele. This was not true of the county faculty. They considered a wide range of county departments and county personnel as essential clientele.

Compared to the organizations represented by the review team, the commodity diversity and the dominance of commercial agriculture as clientele is very strong in Florida. We expect that the fact that Family Consumer Science origins are at Florida State University rather than the University of Florida has significant influence on the culture and current resource base of IFAS. However, it appears to us that the changing educational needs in your communities and the potential long term political support will require you to broaden your programming. Effective programming in all areas cannot occur unless you have a critical mass of specialists involved in research and faculty that have as their primary job, facilitating the educational process with clientele.

Defining who will be IFAS Extension clientele in the next 10 years will be an important decision for this organization. We agree with the often-stated comment that "We must continue to meet

the needs of commercial agriculture." It is an important economic sector in Florida. The obvious question you also raised was "Will there be adequate political support for research and education from public funds as the population and political influence continues to move to a more urban base?" We agree with your consensus that the answer will be "No." The administrative team must quickly address this challenge.

Assuming that you are not able to find a windfall of funds with your traditional support, are there other sources of both fiscal and political support? We believe that you are fortunate to have many potential partnerships that have not been developed to their full potential. Local government officials are one broad group that knows you through their contacts with the county offices, but has not been focused upon as a clientele in the same context that IFAS Extension considers commercial agriculture. The same is true with respect to family and consumer science, 4-H and a broad array of potential volunteer groups.

Addressing the question of balance of faculty in this context is relatively simple. If you decide that addressing the highest educational needs of a broader clientele will help you meet the land grant mission in Florida, you will need new resources and need to reallocate resources you already have. To accomplish this goal, you will also need to explore the pros and cons of alternative educational delivery methods.

This may seem a daunting and difficult task. And we acknowledge that it will offer many challenges. However, we were impressed with the professional attitude and realistic vision that existed with almost every clientele group you included in your review. They know the reality that you face. And to their credit, they indicated they are willing and able to join in whatever endeavor IFAS Extension chooses. They simply want their opportunity to participate in a meaningful way. This will require considerable leadership from the entire IFAS administrative team.

Should IFAS Extension move toward multi-county agents?

Each of the states represented on the review team uses multi-county agents in limited specific cases. One must consider the costs and benefits, and each decision seems to be very specific to the environment being considered. A good reference is the North Carolina web-site http://www.ces.ncsu.edu/depts/personnel/vacancies/respons.htm where you will find general position descriptions. The "Area Specialized Agents" position addresses this specific question.

Does IFAS have the correct balance of administration versus programs?

This is a difficult question to answer. It will depend on where you want this organization to be 10 years from now. However, listed below are some observations relative to this question:

The Vice President, Deans, Associate Dean for Extension and Program Leaders appear to be a close knit group with good communication and camaraderie. This is an important element as the group addresses the pressures brought about by diminishing budgets and impact this has on the future.

The District Directors, by virtue of their job responsibilities, are physically located throughout the state. This is positive and efficient. However, it requires extra effort on the part of both the District Directors and the rest of the management team to facilitate effective communication as a group.

The question, "Can REC directors substitute for district directors?" was raised several times. We strongly advise to not move in that direction. Managing a REC is a major responsibility and is focused primarily on agriculturally related research and educational programs. As noted earlier, the current workload of District Directors is too broad and unrealistic. It is also unrealistic to expect REC Directors to assume these additional duties.

It appears a transition was started in 2000 to move county faculty evaluation to the County Extension Director. We assumed that the District Director's responsibilities were also changed, but this change was not clearly articulated. Our collective experience and observation of states that eliminated district directors is that the outcome has been detrimental to the organization. However, in each of our institutions the role of the district directors has changed significantly in the last 10 years. U.W. Extension has defined the functions for their district directors as described in the following website http://www.uwex.edu/ces/depthead/ddfunctions.html

The role, responsibilities and accountability of middle management in general needs to be clearly articulated and communicated across the entire organization. The old adage .."Form should follow function"… seems appropriate here.

Assess the financial portfolio of IFAS/Extension.

The fiscal support from all resources that Extension receives is excellent, although recent and pending reductions in state support are both alarming and contribute to a general decline in morale among faculty. Several individuals relative to county fiscal support expressed a concern. The counties' willingness to invest discretionary dollars in Extension, as well as the 'in-kind' investments in facilities, is a testament to the high value that county governments place on Extension programs. However, the question may arise in the future as to whom actually employ the county personnel – the University of Florida or county government. The review committee suggests that Extension immediately initiate a Memorandum of Understanding (MOU) with every county that addresses the responsibilities of each party (Extension and county government) and stipulate definitively who employ the field faculty.

The ratio of salary to operating dollars is also quite good. Many states across the nation are addressing the issues associated with high investments in faculty salaries and minimum to inadequate resources in operating. This ratio for IFAS Extension is approximately 80/20 overall, whereas in other states this ratio is often 90/10 or even higher. Extension is to be congratulated for maintaining this flexibility, but should pay close attention to maintaining their operating dollars in light of future budget cuts and restaffing. This will also help to minimize further salary compression in the future. It is of some concern that the state portion of the budget is 86 percent salaries/14 percent operating expenses. We advise that efforts be made to move this toward 80/20 and preferably 75/25.

Where are there opportunities to enhance funding?

Extension and IFAS faculty in general are to be congratulated for their successful efforts in securing outside grants to support their programs. This activity seems to be prevalent at all levels of the organization – campus, RECs and county offices. The opportunity to increase contract work through MOU's appears available and should be encouraged where it legitimately supports faculty programs. In addition, new funding partnerships should be explored to leverage dollars to support programs in both traditional and non-traditional areas.

The committee witnessed almost unanimous support for Extension faculty and their programs throughout the week. Most groups expressed a desire to help IFAS Extension tell its story to county government, legislators, congressmen or others who potentially influence the resources it receives. Every effort should be made to cultivate, educate and train a volunteer network that can speak on IFAS Extension's behalf to those who can positively influence the revenue stream. The committee wants to stress that these individuals need supervision and training to be effective advocates for IFAS programs and thus some resources should be invested to ensure the success of their efforts.

The opportunity to generate 'investment capital' for Extension through your IFAS foundation needs to be examined. IFAS might want to consider establishing a separate 501C3 for Extension which would allow citizens across the state to celebrate the excellent local support they receive by establishing named scholarships, land trusts and/or enhancement gifts to support faculty and their programs.

Does Extension's balance of federal, state, county and grant funding influence our ability to meet industry needs?

The committee believes that Extension's ability to move into new program areas, and therefore realign its programs to meet industry needs, is more influenced by budget reductions than by the balance of the funding it receives. Moreover, with future budget reductions looming, it is critical that any current staffing plan be reevaluated immediately to minimize any negative impacts on high priority programs in Extension's statewide delivery system. It is imperative that Extension does all it can to retain maximum flexibility and an infrastructure that will allow it to pursue new program areas as opportunities arise.

What about 'fees for services'?

Extension should consider adopting a 'fees for service' policy that clearly defines the criteria it will use to decide whether or not a service is to be free, or for a fee. There appear to be excellent examples of 'fee for service' activities already in place that can be used as models to help shape this policy. One example that the committee felt strongly about reflects a successful 'fee for service' model is the Energy program, FEES. Other non-traditional programs, including urban programs and certain for sale publications, represent opportunities to build an excellent 'fee for service' portfolio.

Is IFAS/Extension following a sound program planning/development and evaluation process? How could it be enhanced? Are delivery methods keeping up with needs of clientele?

The current program planning, development and evaluation process appears to be adequate for IFAS/Extension to this point. However, considerable attention should be given to launching a new program planning, development and evaluation system to address contemporary issues of the state and local communities. The new system should emphasize outcomes, impact, accomplishments and change. The review team recommends:

Initiate strategic planning, implementation and evaluation process that establishes statewide vision, values, mission and priorities.

Significantly expand the network of stakeholders and program participants.

The current design team process should be reinvented. No more than five, issue focused statewide design teams should be created. Each team should have a comprehensive charge to be bold, innovative and entrepreneurial, and capitalize on the strengths of IFAS. The design teams should, in part, be self-selected and given funding to support the operation. The teams should be nimble and have a sunset.

Review the status of information technology systems throughout IFAS/Extension and develop a visionary implementation plan that promotes application in programs.

Focus on expanding programs to significantly increase volunteers.

Strongly consider implementation of "train the trainers" program models.

Expand "master programs" especially for clients who are seeking more learning opportunities.

Implement a program advisory committee system to direct local and statewide priorities and programs. Be sure to be inclusive of the diverse population in Florida.

Promote and implement regional programs with Georgia, Alabama and other states, as appropriate.

New agent training and professional development intertwine with program development. We recommend that IFAS Extension participate and use the concerted professional development efforts being made by the Southern Regional Extension Directors with Ron Brown's leadership. Two issues will require increased training of personnel: the anticipated turnover of personnel and moving Extension in new programmatic directions.

Assess the relationship of Extension, Research and Academic Programs within IFAS. How can we improve the feedback loop from extension faculty to influence our research agenda?

It is clear that the administrative leadership team of IFAS has an effective and productive relationship that yields program coordination and team leadership. However, there appears to be significant lack of understanding and appreciation of the roles and responsibilities of faculty with

county, DED, REC and department chairs. Communication and coordination of programs and operations is inadequate to build quality programs.

The review team recommends:

Use the work of Ernest Boyer to broaden vision and definition of scholarship, and to revitalize promotion and tenure expectations. There is considerable literature with specific reference to numerous other institutions.

Implement an innovative grant system that promotes integrated Extension, Research and Academic programs.

Use information technology to facilitate communication and to create integrated program development and coordination.

Assessment of Strengths and Weaknesses of UF/IFAS Extension Partnerships

UF/IFAS has a partnership with 67 counties. Effectiveness of this partnership is evident through the following: signed MOUs with approximately 50 percent of counties; increasing county cost share; renovation and construction of approximately 23 new county Extension office facilities; and 72 100 percent funded county agent positions. County government now represents the largest funding source for Extension.

Unfortunately, 50 percent of counties do not have a signed MOU. The failure to mobilize county government to support appropriate state funding of IFAS represents an unfulfilled potential. Additionally, the large urban counties - three with more than 32.3 percent of the state's total population and 23 counties with populations above 200,000 - may require a special negotiated MOU – creating a new partnership relationship. The needs and expectations of large urban counties are significantly different from needs of smaller more rural counties. In addition, in approximately 15 counties, county Extension directors do not have the ability to talk directly with county commissioners. This may be a disadvantage.

More than 37 federal, state and other agencies and organizations are Extension partners. These partnerships include strong support from commodity groups. However, there is need to continue cultivating non-traditional audiences as partners. Also, IFAS needs to evaluate creating a diverse extension advisory council at the state level and providing advocacy training. Master volunteers, such as master gardeners and master naturalists, also represent a significant pool of well trained and educated leaders. With appropriate advocacy training, these volunteers could be effectively mobilized.

Although information on the 1890 program was shared, not much evidence was presented to determine effectiveness of this partnership. Issues of funding may have prevented prompt filling of 1890 county and state positions. Since the new president of Florida A & M University is a University of Florida graduate, strengthening of this vital partnership is anticipated. UF needs to encourage and support implementation of the 1890 staffing plan.

Marketing Extension

Several of the IFAS Extension clients mentioned the fact that Extension in Florida is the best kept secret. They were referring to your marketing … both as a logo and message. This is an important but tricky area to address. Vice-President Martin clearly articulated that any marketing plan for Extension must include IFAS. This is an area that we recommend IFAS obtain some outside assistance. Many large corporations and agricultural commodity groups in Florida have expertise on their national marketing staffs. They may be willing to help if you ask.

Related, and just as important, is having a strong advocacy plan for IFAS and Extension. Communicating with decision makers is just as important as having people recognize your logo. The emphasis should be on building partnerships to work on important public issues in Florida. The plan should be comprehensive, ongoing, and focused on education. This should be a total staff effort.

Washington State University has a detailed marketing plan which you can find at the following website http://www.wsu.edu/IntegratedMarketing/process/index.html

Respectfully submitted by,

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f. SUCCESS STORIES

Goal 1

Focus 1

More than 900 educational programs were conducted for producers, allied industries, government agency personnel and others with an audience of more than 1 million. Information was provided on business management, climate and weather, harvesting/processing, integrated pest management, marketing, policy and trade issues, and appropriate and new production practices. As a result of these educational programs, producers are adopting best management practices, selecting appropriate varieties, rootstocks, and cultivars, utilizing appropriate fertility practices, utilizing efficient irrigation strategies and proper integrated pest management strategies. In addition, producers are evaluating alternative enterprises and developing new market strategies.

Florida Cooperative Extension personnel cooperated with Emergency Management, USDA Farm Service Agency, Florida Department of Agriculture and Consumer Services in preparation for and recovery from the 4 hurricane disasters. Crop loss damages were accessed by extension agents in cooperation with commodity organizations, the Department of Agriculture and the USDA Farm Service Agency. Meetings were held throughout the state to determine what assistance was needed immediately after the storms and meetings were held to assist producers with their applications for assistance. For agriculture and related resources, the losses exceeded $2.1 billion.

Specific examples:

Production School Success Story: Survey data represented 49,225 acres with 70% indicating that information presented at the citrus production school will increase ability to make better decisions about production practices. From the changes 30% will increase production, 22% will decrease production cost, 36% will change the manner in which production practices are selected, 88% indicated information presented will increase the ability to make better decisions.

With the assistance of the USDA Agencies (FCS and NRCS) over 45 commercial livestock producers have adopted recommended BMP's.* Over fifty commercial producers and five Ranchette producers adopted alternative enterprises. Most of the alternatives were in sod production. The economic impact to these producers in 2004 was estimated at $ 500,000.

In FY04: 81% of livestock producers examined their herd for breeding soundness. 80% vaccinated their breeding herd and/or feeder calves using appropriate vaccines, recommended sites, and techniques.43% of calves were sold through group marketing. 35% practiced a controlled breeding season. 65% planted improved forages, analyzed their forage and/or have a practical least-cost winter nutrition program. 15% used implants. 92% practice the use of external and internal parasite control (fly, worm, and lice).

Small Farms/Alternative Enterprises Website Development – The first of the educational products delivered by the Small Farms/Alternative Enterprises Focus Team was an extensive new website, http://smallfarms.ifas.ufl.edu. This site was developed by the efforts of 17 topic leaders from within UF/IFAS and FAMU. The website was created to assist county extension faculty deliver educational programs and information to small farmers in Florida.

Although some clam seed hatcheries showed an effect by selective breeding on overall diversity, genetic diversity has not yet been reduced to levels at which problems are likely to arise. These efforts represent the first at looking at stock management and improvement for the emergent clam aquaculture industry.

Mechanical Harvesting: Efforts to increase the use of "Mechanical Harvesting" in Florida's citrus industry resulted in a series of 8 articles developed for Citrus Industry Magazine in addition to workshops and 4 field days. Awareness of current systems increased with over 200 participants actively involved in one or more events. Articles began in January and continued until October. Articles reached over 10,000 producers by utilizing the magazine as an educational tool.

Economical Citrus School: Series reached approximately 20% of industry's acreage with 4 meetings. Survey data indicated 100% found program useful and gained knowledge. 94% will share knowledge gained with others. 82% indicated they will improve management practices due to the program. 75% indicated program information received will have a positive financial impact on their operation with a 10.4% savings and a 10% yield increase. All 'citrus' agents made all program presentations.

Ten field days and on farm demonstrations were used to teach the use of the plastic mulch and trickle irrigation method of production. These techniques have resulted in a 50% reduction in water and fertilizer use among participating growers.

98% of container grown nursery producers have abandoned overhead irrigation systems and now use microirrigation technology, tensiometers and other drought sensors to improve their irrigation efficiency

According to trade association, grower input, Florida Agricultual Statistic Service and weather data; citrus, strawberry, fern, ornamental plant, and vegetable producers "saved" 18 billion gallons of water and $9.33 million last year by using the cold protection management tools and real time weather data on FAWN.

According to the USDA National Agricultural Statistics Service (NASS), Florida blueberry acreage increased by 21% between 2003 and 2004 while the overall US acreage increased by about 7% during that same period. Florida had an estimated 2300 acres of cultivated blueberries in 2004, up from about 1900 acres in 2003. The National Agricultural Statistics Service, USDA (NASS) reported that Florida blueberry production in 2004 was about 6,000,000 pounds. Use of improved cultivars and better knowledge of, and attention to, cultural practices such as freeze protection, pruning, and leaf spot disease management have resulted in increased profitability for several consecutive years which has encouraged additional planting and continued expansion of blueberry acreage.

Southwest Florida citrus growers and the Florida citrus industry saved over 8 and $37 million, respectively. If one pesticide application per season could be avoided due to scouting, citrus growers in SW Florida will save $50/acre which will come up to ($50/acre x 170,000 acres) $8.5 million total saving and the Florida citrus industry will save ($50/acre x 750,000 acres) $37.5 million total saving.

We are evaluating several new soil moisture probes that can improve citrus irrigation efficiency. Advantages and disadvantages of these probes have been noted and this information has been given to growers at county programs and in extension bulletin and magazine articles. Grove operations covering more than 3000 acres have started to use these probes and have reduced water use by more than 5%. This has resulted in a savings of more than 81 million gallons of water per year.

We have shown that irrigation quantities can be reduced by stopping irrigation in the fall and winter. Field tests have shown that stopping irrigation from November to early March can save over two inches of water on Valencia oranges with minor effects on yield. We found a beneficial increase in fruit soluble solids (brix). These results have been presented to growers. If this practice were applied to 2000 acres, there would be a savings of 108 million gallons per year.

123 tensiometers were, calibrated and installed in 2004.Total acreage monitored by tensiometers is close to 900 acres. Tropical fruit growers are reporting savings about 40, 700 gallons of water per acre per week. Growers are saving up to 50% in water use and about 30% in fertilizer use. Tropical fruit growers may potentially save about $65/acre in fertilizer cost. With about 11,000 acres of tropical fruits potential savings may reach $715,000.

Producers utilized IPM scouting on approximately two-thirds of the peanut acreage and 85 percent of the cotton acreage. Informal surveys indicate they have saved at least three insecticide applications resulting in a minimum of $40 per acre increased profits. Additional benefits have been realized with increased yields through proper timing of pesticide applications.

Florida now has a Strategic Management Plan for Artificial Reefs, and is moving toward Best Managment Practices. The Steinhatchee Fisheries Managment Area (FMA) is now federally permitted to the Florida Agricultural Experiment Station, and Phase I reef construction is commencing with State funding. This FMA is the first FMA of its kind in the nation.

Six hundred (600) acres of pine trees were planted on idle land by 6 landowners. This acreage should generate $ 6,500 worth of sawtimber/acre at harvest. Fifteen hundred (1,500) acres of pine trees started to be harvested annually for 15 landowners. This generated an additional $8,000 annually for each landowner.

As result of information presented, 64% of the respondents attending the 2004 Panhandle Peanut Shortcourse indicated they planned to make variety selections based on their management and production goals for the 2004 crop year. Management strategies included variety selection for resistance to TSWV, adjusting planting date,seeding rates and row spacing to minimize losses to TSWV.

As a result of the seminars, publications and farm visits during the year, 50 nurseries (50 percent of the nurseries surveyed) had implemented a scouting program and a preventive treatment program to reduce the impact of the Pink Hibiscus Mealybug to the nursery industry in the county.

Focus 2

57 educational programs were conducted in Florida with an audience of almost 300,000 people. These educational programs resulted in increased support for agricultural and natural resource industries, a greater awareness of their economic impact and increased public awareness of the environmental stewardship practices utilized by agricultural and natural resource entities.

Specific Examples:

Over 600 farmers and their city cousins attended the 32nd annual Farm-City Day Celebration where outstanding farmers and their accomplishments were recognized. Attendees were also appraised of the economic importance of agriculuture to the County's economy and the importance of farms to the quality of life all Jackson County Citzens cherish.

Through continued educational efforts via the mass media, Cedar Key is recognized as a national producer of hard clams. Continued actions of local government, both county and city, reflect their awareness of the importance of their new shellfish resource-based economy.

Youth Education Programs – Youth in the Suwannee Valley participated in several educational activities associated with the North Florida REC – Suwannee Valley. Major events included: Fall Festival Youth Ag Days Annual Youth Ag Safety Day and Farm Tour Several School Tours and Day CampsOver 2,000 youth participated in these various educational activities. In addition to the 2,000 youth, over 250 adult educators and volunteers actively participated in these activities.

Tour participants see and hear first hand the challenges that development are playing on the ability to protect the environment and agriculture. Participants also learn that agriculturalist strive to be good stewards of the environment.
Policy makers are given the opportunity to talk with producers and tour facilities which are impacted by

their decisions regarding growth management.

Focus 3

More than 75 educational programs were conducted reaching an audience of more than 11,000 people on processing, distribution, safety and security of food systems. Food processing, service, preparation, and distribution are all vital activities that support the people of Florida and the state's

agricultural industry. New and value-added product development contributes to a viable market for Florida products and provides for the array of products consumers expect. Effective distribution systems also enhance the state's ability to compete effectively in the domestic and global marketplace. As a result of these educational programs there has been an increase in improved food harvesting practices, improved food processing practices, and improved safety and security at the retail level.

Specific Examples:

Workshops on postharvest quarantine and handling treatments have resulted in greater options and potential for marketing high quality Florida tropical fruits.

Florida citrus products and marketers have tools needed to help them continue to be world leaders in the global business of citrus and beverage processing and packaging.

Fifty-two shrimp fishermen & processors were trained in methods that they could use to increase the quality of shrimp they harvet/process.

The series of nine guidance documents were adopted by the Assoc. of Food and Drug Officials as their national training materials.

All of the shimp boat captains reported that they liked using the Leatherback TED's and had better shrimp catches. Six captains also reported that they were looking at the economics of switching all of their nets to the leatherback TED.

Focus 4

More than 183 educational programs were conducted for agricultural clientele on worker protection, pesticide safety, integrated pest management strategies, diagnostics, scouting, and invasive pests. More than 180, 000 people attended these group educational events. In addition, more than 600,000 individuals were reached via client visits, e-mails, radio/TV programs, and website education. As a result agricultural workers are adopting safe pesticide practices, worker protection practices, use of appropriate pesticides and application technologies, integrated pest management strategies, and agro-terrorism prevention practices. In addition, pesticide licenses were obtained and continuing educational units were provided current license holders.

Specific Examples:

Over the years of conducting equipment and pesticide safety as well as WPS (worker protection standards) class, a marked increase in awareness of safety has taken place within the local citrus industry. Grower conversation has indicated that safety practices have increased and when field visits are made one can easily see improvement in the work environment. 238 participants have earned 351 CEUs in 13 events.

Of the 250 Hispanic agricultural and landscaping workers that participated in the Hispanic license certification program about 147(58%) were able to get their pesticide license certification. These new certified pesticide applicator will find better opportunities in their current job and abroad.

The correct identification of plant disorders and recommendations provided has reduced water and pesticide use by an estimated 30 per cent.

Through a CORE CEU correspondence program initated with FDACS and C&V magazine, over 100 repondents requested the question set corresponding to the first article and 94 successfully completed it. Funding has now been secured for 11 additional articles, authored by extension agents, for 2005, giving applicators more opportunities to earn CEUs while learning about pesticide safety.

Sixty-eight (68) individuals learned practices to reduce pesticide risks for themselves, their family, and the farm workers. Sixteen (16) persons renewed their pesticide licenses and fifty-two (52) persons recived CEU's towards their pesticide licenses.

First Detector and First Detector Educator certification granted to participants of regional and NACAA training, complying with mandate fo Congress and goal of USDA/CSREES - NPDN

Participants of First Detector Educator training at NACAA (80 post tests) showed 5% increase in knowledge/awareness of biosecurity/threat to agriculutre, above an already high awareness level (84% to 89% as measured on post-test)

An inspector for the Department of Agriculture and Consumer Services (DACS) has said that the WPS training for the strawberry industry was successful since farms have been doing very well with their inspections and subsequently have not been fined for violations. Five nursery managers have contacted the extension agent after inspection to report that they were not in voilation and to express appreciation for the training.

Increased numbers of bilingual (English/Spanish) mid-management level workers are attending WPS training, increasing the likelihood that spanish-speaking workers will recieve effective training in their own language.

Goal 2

Success Stories for Water Resources

Over 120 tons of horse manure and pine shavings were composted and spread over grass recreation fields and pastures. The manure was previously in unmanaged piles and was being hauled to local landfield. The composting saved the county $27 per ton in landfill fees plus gave the county a valuable soil amendment for its' parks and grass areas.

Program evaluation and other surveys, and clientele contacts (agencies, associations and individuals) show that knowledge and background about hydrological issues and limitations surrounding the agricultural area in the south of the Everglades is increasing. Farmer groups (Farm Bureau) and local/regional institutions (USDA-NRCS, SFWMD, SDSWCD, USGS) requested consultations and information on current hydrological issues in the area.

SFWMD has modified the projected use of one of our study areas (Frog Pond) following the Extension of our Research results through programs for growers and agencies. The area was intended for surface storage (detention pond) in the Everglades Restoration effort. Our research showed large seeping from this type structure in the area that made this option inefficient. The remainder of the area will continue to be leased to farmers and not converted.

Based on three years of data, Miami-Dade farmers can potentially reduce 70% of the water applied to

horticultural crops by using low volume-high frequency, soil moisture based irrigation promoted by this extension program.

Information about the existing water conservation practices has been obtained from an extensive survey of growers (tropical fruits, vegetables and ornamentals) and golf managers. The survey had excellent response, close to 40%, from two commodity groups (Tropical Fruits and Ornamentals). The survey has resulted in the identification of current and future research and extension needs that have been presented to the different commodity groups in Miami-Dade.

61 community leaders participated in an informal series of five 2 1/2 hour workshops and two field trips designed to enhance understanding of water-related issues. A multifaceted water related materials notebook was also created for participants. 34 of the participants completed all sessions and were recognized before the Polk County Board of County Commissioners during a regular Board Meeting (June 9, 2004).

Surveyed growers estimated their average savings and/or efficiency to be around 10%. The average yearly cost of a simple irrigation program in SW Florida commercial groves is around $150/acre. The positive financial impact can achieve a saving of about $2.55 million (10% x $150/acre x 170,000 acres) for citrus growers in SW Florida and $11.25 million (10% x $150/acre x 750,000 acres) for citrus growers in the state.

Success Stories for Conservation and Sustainable Use of Coastal and Marine Natural Resources

Eighty eight beach cleanup volunteers donated 260 volunteer hours by removing 1,007 pounds of trash wihtin 3.5 miles of shoreline filling 65 trash bags. From follow-up survey, 83% indicated they increased awareness on the impacts of marine debris to water quality and habitats.

Twenty five teachers attended a workshop on invasive species. Of the 24 responding to a survey, 100% said they increased their knowledge, and 100% said they would make a practice change as a result of attending the program. Pre and post test indicated a gain in 24 points on the post-tests. Approximately over 400 students have learned about invasive species from teachers attending this workshop.

89% of Master Gardener trainees stated that they would help protect water resources as a result of training provided.20 students were certified as Master Naturalist from completing the Florida Master Naturalist Program Coastal Module. Students showed a 19% gain in knowledge and skills as measured by a pre and post-test.

Four boy scouts received their Eagle Scout Badge for their efforts in the Mono Fishing Line Recycling Program. As a result, 27 outdoor bins were installed at marinas, piers, and parks. Sixty four volunteers donated 459 volunteer hours installing bins and educating the public about the recycling program. Almost 200 pounds of fishing line was collected from outdoor bins. Miami Herald Newspaper wrote an article highlighting the program and the efforts given by one of the boy scouts.

After speaking a group of local fishing experts, a local recreational charter fishermen requested 15 venting tools for his efforts in educating his clientle proper catch and release skills. In addition, IGFA Fishing Hall of Fame provided fish venting information at their fishing tournaments educating at least 100 anglers the proper techniques.

Assisted Dinner Key Marina and MiaMarina with educational materials necessary to become certified as a "Clean Marina" facilty. As a result, Miami-Dade County now has three certified marinas in the program. In addition, Sealine Marina has also been certified as a Clean Marina and awaiting a date for the official ceremony.

Follow-up survey indicated at least three boaters regualarly users the bilge sock and have increased their knowledge about clean boating habits from receiving the spill kit bag. In addition, 33 students produced 230 hours of community service from their efforts in distribution and information delivery of the fuel spill kits bags to boaters.

Sixty five boaters signed a pledge card promising to use the bilge sock to absorb fuel and oil in their boat. Bilge sock absorbs 2.5 quarts of oil. (approximately 40 gallons). Socks provided free of charge ($16/bilge sock). ($1040 dollars saved).

33 volunteers performed 230 hours of volunteer service for fuel spill bags distribution for over 600 recreational boaters. ($16/volunteer hour = $3680) In addition, I was interviewed for Waterfront Newspaper, local marine newspaper, on the project which reached about 40,000 people within the marine community.

Sixty four volunteers performed 460 hours of volunteer service for fishing line recycling and recovery projects at over 7 sites. ($16/volunteer hour = $7360).

Eighty eight beach cleanup participants performed 260 hours of volunteer service for collecting trash along 1 miles of beach. ($16/volunteer hour= $4160).

The SEFCRI was being managed without local focused leadership, making it difficult to fully develop a Local Action Strategy. As the Local Navigator for the Awareness and Appreciation Team, I partnered with agencies/ngo's to develop a 25 member team and coordinated them to draft the AA portion of the strategy. As a result of one AA goal stating that in order to effectively implement a strategy a program manager would need to be located in south Florida, a manager was hired in May 2004.

The Gulf of Mexico Fishery Management Council modified four regulatory proposals based on scientific and industry input.

Initiated joint project with Mote Marine Laboratory to implement a volunteer angler tagging program in the Florida Keys and South Florida.

Agent investigation of working waterfront issues has resulted in politically influential business owners asking the BOCC for assistance in preserving the working waterfront. THe BOCC will consider in 2005 a moratorium on redevlopment and implementation of a waterfront management plan.

The U.S. Coral Reef Task Force held its 2004 meeting in Miami and needed local agencies to host relevant workshops. I partnered with FDEP to conduct the Sustainable Diving and Snorkeling Practices workshop. Of the 64 attendees, 82% indicated that it was very good/excellent and 74% would like to see future workshops. I received a letter from the Department of Commerce, thanking me and Sea Grant Extension for my expertise and vision contributing to the workshop success. 2005 workshops will be held

I presented 3 education programs on coral reef ecology for the Broward Public Schools Summer Science Academy. 95% of the students learned new information and 96% felt other students would benefit from the information. I received a letter from the School Board of Broward County thanking me on behalf of the School Board, teachers and students, for my participation. She stated that as a result of my endeavor, she now hears students talking about marine resources, water quality and other key issues

The Gulf Awareness Seminar Series was well received by our local citizens. It provided a unique opportunity for citizens of this island community to interact with university researchers and resource managers.

The Florida Institute for Saltwater Heritage has raised over $300,000 in the past five years and resulted in the purchase of environmentally sensitive land. The only other way to purchase similiar environmental benefits would have been to use public (taxpayer) money.Total of 1,375 instructional hours.

As a result of a partnership with Ocean Watch Foundation, 170 volunteers from the Royal Caribbean Cruise Line planted 400 sea oats on Hallandale Beach dunes. 98% of the participants stated they gained knowledge and 100% were satisfied with Sea Grant Extension services.

In partnership with the National Save the Sea Turtle Foundation, 55 volunteers removed 664 lbs of trash and marine debris from 2 miles of coastline during the Coastal Cleanup. 73% of volunteers stated that they gained knowledge about marine debris and its impacts on marine resources. The Sea Grant agent was

quoted in the newspaper, regarding the educational component of the event.

The Manatee Awareness and Boating Safety poster contest generated participation from 12 public and private schools and 4H clubs, resulting in 38 awards. Presentations on manatees were given to 437 youth. 89% indicated they gained knowledge about manatee ecology and boating impacts that threaten manatee populations. A newspaper article and photo appeared in a local paper.

In partnership with the MIASF and Broward County EPD the Sea Grant agent coordinated 160 volunteers to remove 500 lbs of trash from the North Fork of the New River. 110 youth volunteers also participated in hands-on activities to educate them about marine debris. A follow-up survey of youth leaders indicates a 100% knowledge gain about marine debris and its related impacts and 100% satisfaction with Sea Grant Extension services. A more comprehensive education packet will be developed for 2005.

A comprehnsive follow-up mail survey documented that 70% of anglers that received Sea Grant fish venting training adopted the practice. During the past three years a total of over 1,000 venting tools have been distributed in the Tampa/Sarasota Bay area.A milestone was reached this year -- for the first time, venting tools are now commercially available (Aquatic Release Conservation, inc. www.dehooker4ARC.com. This project has realized the accomplishment of demonstrating behavioral changes.

A total of one hundred and thirty five 2004 Floirda Artificial Reef Summit participants representing 20 counties reported that the Summit provided relevant informantion that would be used in planning, building and managing artificial reefs.A total of $10,000 was obtained to facilitate summit planning. Total summit budget was apporximately $20,000.130 instructional hours.

The FWC, Fla. Keys National Sanctuary Program and commercial sponge industry are using the technical information provided to properly manage the sponge fishery. Information has also been communicated to national and international audiences of fisheries and natural resource managers.

The Florida Fish and Wildlife Commission, Florida Keys National Marine Sanctuary Program and sponge industry are using the technical information provided to properly manage the sponge fishery. The information is also being used to evaluate restoration of the Flroida bay Ecosystem. Information has also been communicate to national and international audiences of fisheries and natural resource managers.150 instructional hours.

Testing of Master Gardeners after coastal plant training session documented that all participants had increased their knowledge of coastal plant ecology and identification.240 instrucitonal hours.

With Sea Grant Marine Economic Specialist, a survey was carried out at the request of the Citrus County Tourist Development Council which indicated that the economic impact of the recreational scalloping season on Citrus County measured over $2 million. This gave reason for the TDC and Citrus County Board of Commissioners to request that the state continue to support the scallop restoration program currently being carried out by Fla. Sea Grant, Univ. of South Florida and FWC.

Due to safety concerns, Florida legistlators were considering regulation of the parasailing industry. The Coast Guard Tampa Marine Saftey Office requested that the marine extension agent facilitate a national parasailing operators meeting to see if a self-regulatory program could be developed. The Coast Guard has reported that it are now working with the Florida parasailing industry in developing an educational and voluntary insepection program.440 instructional hours.

Collaboration with the Sarasota Bay National Estuary Program increases the number of organizations that can utilize Sea Grant research and educational materieals.230 instrucitonal hours.

For 15 years, I have served as Tournament Director for the St. Petersburg Pier's Annual Kid's Fishing Tournament. Each year has seen this tournament grow in size and attendance. On 5/8/04, over 520 children, 12 years of age and younger participated. Each child was accompanied be a sponsoring adult. The purpose of the tournament is to provide a recreational (fishing) learning experience and to begin to

instill the concept of ethical angling, conservation and fishery management to the children

During the program year 2004, I participated in extension advisory committee meetings in Pinellas (4/2, 11/24), Hernando (8/17, 12/2), Citrus (1/23, 11/9). St. Petersburg Pier Aquarium Board of Directors meetings (1/20, 2/17, 3/16, 4/20, 5/18, 7/20, 9/21, 10/19, 11/16 and 12/14). At each of these meetings UF/IFAS Extension and Sea Grant were major contributors to to the programming.

During 2004, a number of marine/fishery workshops were held for clients withing the areas of reponsibility. These included: 2/2, Baitfish, Ruskin, 22 participants; 2/24, Seafood Preparation, Homosassa, 45 participants; 5/11,Ecotourism, Crystal River, 35 participants; 11/24, Fish Smoking, St. Petersburg, 42 participants; 12/16, Fish Smoking, Homosassa, 48 participants. At each workshop UF/IFAS and Sea Grant materials were distributed

On April 27-28, 2004 the annual Artificial Reef Coordinator's Conference was held at Mote Marine Laboratory in Sarasota. I assisted with the planning and logistics of this meeting, which was begun some ten years ago by myself and Marine Agent Stevely (Manatee County)for reef coordinators in our immediate county areas.

Due to outreach activities 300 venting tools were distributed. An additional 37 requests were referred to the commercial vendor website. Fishermen are reporting successful venting and release as a result of the venting tool use. Mote ML research also continues to demonstrate venting success.

Over 250 participants attended the 56th Gulf and Caribbean Fisheries Institute, representing academic institutions, governmental agencies and NG0's, and commercial fishing communities throughout the Caribbean and Gulf of Mexico. A questionnaire provided at the end of the conferences indicated that 100 % of the attendees were provided useful knowledge relevant to their occupation in fisheries science, and that they planned to continue participation the annual GCFI conference in the future.

Twenty five 4-Hers increased their knowledge of coastal ecosystems (summer camp).One hundred fifty middle school students increased their knowledge of the local commercial fishing industry and coastal ecology (Farm City Week essay contest lectures).200 instructional hours.A total of 2,000 anglers, boaters and divers have increased their knowledge of artificial reef locations and how to fish these reefs properly as a result of guest speaker appearances by the marine agent. As a result of safety programs for 47 SCUBA divers there have been no injuries in three years while the group collected over 21,000 pounds of marine debris from Boca Grande Pass.

Kayak club members learned to identify mangrove, seagrass, and salt marsh species in addition to learning about their biology and ecological benefits.

One hundred fifty bilge socks were distributed at the Pensacola Boat Show. These socks will prevent 225 quarts of oil and fuel from entering local waterways.

Three hundred twenty two people signed the Clean Boating Pledge promising to follow best management practices to protect the environment while boating.

The US Fish and Wildlife and Florida Fish and Wildlife Conservation Commission recommended the Turtle Friendly Beach Program assist coordination of sea turtle lighting and sand fencing education efforts in the Florida Panhandle.

The Red Snapper World Championship fishing tournament purchased Sea Grant Novak venting tools for all participants. The Sea Grant agent demonstrated their use at the captain's meeting.

Coordinated partnership between Escambia County Marine Resources and the Sea Grant Waterways Management focus group after Hurricane Ivan. The Waterways group created GIS files on vessel restriction zones for replacing signage and mapping.

Requests for Resource Rangers programming from educators, home-school, and 4-H increased from 2003. The video series was distributed to every elementary and middle school in Escambia and Santa

Rosa counties. The show aired on television in three Florida counties and in Cape Code, MA.

Both the Cedar Key Aquaculture Association and the Cedar Key Oystermen's Association realized they have a unique opportunity to help each other. Clam processors must get rid of shell that is a byproduct of their operations. Oyster harvesters want to replenish their fishery by replacing shell as cultch on the natural reefs. Thus these organizations are working together in these efforts.

Over 600 mangrove seedlings were planted in the IRL during 2004, with an estimated value for each mature tree at $4,000 for its value as shoreline protection from storm and erosion, and as nursery habitat for important marine species.

Fifteen people contacted the office for additional information.

The State of Florida now funds artificial reef construction specifically designed for fisheries conservation, rather than exploitation, and no longer requires their locations to be publicized.

The State of Florida, in partnership with the Florida Agricultural Experiment Station, has established the Steinhatchee Fisheries Management Area as the first large-area artificial reef site of its kind in the nation, designed specifically for fisheries conservation objectives.

The State of Florida now has a Strategic Artificial Reef Management Plan, with the responsible State agency and this extension program working toward Best Management Practices for reef development.

I have been working with a USF professor and a graduate student to construct a restorational oyster reef in Pinellas County. Utilizing $80K from the National Marine Fisheries Service, fossil shell has been obtained, reef site has been staked out and water parameters collected and analyzed. Contractor scheduled to place shellstock into place in 4/05.

Four particpants of the Master Naturalist program continue to take additional training offered, and volunteer regularly with other marine activities.

After volunteering and learning kayaking skills, student volunteers from Navarre High School marine science classes started a kayak club that meets once a month for kayak trips. In addition students from these classes continue to volunteer with othermarine extension activities.

Success Stories for Conservation and Sustainable Use of Freshwater and Terrestrial Natural Resources

Tri-state Longleaf Pine Groundcover Restoration Symposium participants came from 5 southern states. Management practice change was declared by those who manage or influence 13.9 million acres. Among exit survey respondents, 91% declared question answered or problem solved by the information presented, 95% plan to share information learned, 92% would recommend the symposium to others, 53% rated the symposium excellent, 36% very good and 8% good. Economic impact estimate up to $1,000/acre.

Success Stories for Environmental Education

Two counties teamed up to develop and implement a summer environmental day camp.Four agents attended PLT Facilitator Retreat for additional information.

I went to the Post Office and upon reaching the counter the Agent told me that He loves the show and that he learns something new every show and that his Yard has improved significantly because he does "everything I tell him to do!"

Kayak club members learned to identify mangrove, seagrass, and salt marsh species in addition to learning about their biology and ecological benefits.

Over 100 Tampa Bay Area forest land owners and other participants at the 7-week Master Tree Farmer Training, "Champion Tree" Planting demonstrations, Master Naturalist and other extension programs learned how to improve urban wildland management practices, protect the environment and realize more

income.

Through the 720 Television broadcasts over 700,000 residents in three counties learned how to conserve water, reduce pollutants in estuary runoff and enhance wildlife ecosystem environments.

More than one-half of a ton (1,150 pounds) of air potato spuds were taken away from one county park and county residents were educated though print and television.

A demonstration garden was established in 1998 by a group of Seminole County Master Gardeners in the back of the Student Museum as a complement to their curriculum for the approximately 5000 elementary school students that visit the museum every year. It has received the Florida Master Gardener Award of Excellence for Demonstration Gardens by the U. of F. in 1999 and the Community Beautification Award from the City of Sanford in May 2000. Also received a special FNPS Landscape Award in Historic Landscapes in the non-professional category in March 2002.

Goal 3

Focus 1

Communication Success Skills

Life skills programming in Florida 4-H enhances the development of communication skills of youth. This past year, 29,422 youth in Florida 4-H made positive changes in their communication knowledge and skills. Youth participated in variety of delivery methods and programs to gain these skills. The following are examples of highlighted Florida success stories in this area:

- In one county, the 4-H Tropicana Public Speaking Program has increased from 650 youth in 1997 to 1,200 youth participating in the program annually. A random survey of 3rd-8th grade teachers revealed that all of them used the program to prepare students for the writing portion of the FCAT. A survey also showed 100% of teachers rated this program as a valuable method for teaching communication skills, preparing and presenting speeches and increasing students' communication skills.

- Students utilize public speaking curriculum within the club and school settings. A survey of participating youth indicated that 80% gained the skills and confidence to enter public speaking contest sponsored by other organizations; one youth has earned up to $1200 in college scholarships.

- The 4-H Ambassador program provided another county with an opportunity for youth to use their communication skills to promote 4-H to other community, school and youth organizations. The 4-H member spoke to over 200 people about 4-H opportunities resulting in 10 potential new adult volunteers.

Success Stories for Decision-making, problem-solving, critical thinking skills

Life skills in the areas of decision-making, problem-solving, and critical thinking are learned and used in events and activities that call for analysis, comparison, and determination of rank or value. Of 6,780 youth evaluated for knowledge gain and skill development, 6,460 youth indicated that changes have

been made. Judging activities and events are predominant in the successes reported. Participation in club program planning also indicates and ability to work cooperatively and make decisions for a larger group.

Seven counties reported that judging teams of various sorts had a great influence on youth to enhance critical thinking and decision-making skills. "One hundred ninety-two youth participants in the Farm Manager and Farm Judging contest learned to determine quality products and make decisions to manage a profitable farming and/or ranching operation." Other activities also support these skills. "After participating in a session on using food dollars wisely, seven out of ten youth were able to eat lunch for under $5 and ten out of ten ate lunch for under $6."

Program planning involves a number of skills in order to build effective club meetings, activities and events. One county cited, "In a survey of 44 members, 41 reported being involved in club decision making and program planning." Another county reported that youth were "able to cooperatively prepare programs that they led at camp."

Success Stories of Youth Leading and Serving Others

Florida youth participated in a variety of 4-H activities at club, county, district and state levels aimed at developing competencies in citizenship, volunteerism, and teaching, serving and leading others.

Many success stories are a result of volunteer opportunities organized by youth that benefited hundreds of Florida residents after 4 hurricanes swept through our state. In one county, over 600 families benefited from the distribution of food, water and ice by 4-H members during a 4-day period. In many counties, 4-H members worked side by side adult volunteers, parents and community leaders to assist with hurricane clean-up. Additionally, food and holiday gifts were collected and distributed to needy families in these communities. A social service agency director remarked that "4-H'ers could be counted on to be kind, generous and caring toward the needy families".

Several Florida counties were able to successfully employ all 4-H members in at least one community service project during the past year. In one county, 229 youth and their parents participated in service learning projects during the year. These youth and their parents set goals for these projects and fostered the necessary community connections in order to complete them. Examples of completed service learning projects include; food, holiday gift and school supply drives and special events with seniors. One 4-H member received a special youth volunteer award (TV 12 Kids Who Care Award—nominated by a community member) and countywide recognition as a result of her hard work. She had completed over 1000 hours of community service throughout her 4-H career.

Many counties engaged 4-H members in various citizenship programs including; Know your County Government, County 4-H Youth Council, State 4-H Legislature, State 4-H Youth Council and 4-H Ambassador Programs. In one county, over 100 youth that participated in a Know Your County Government program reported increasing their knowledge of local and state government as a result of the program. Another county reports that 76% of the youth participants in a Know Your County Government program reported that they are making a difference in their community as a result of the program. They report that they now; recycle more, have registered to vote, began volunteering, pay attention to local news and are considering careers in the government.

Florida 4-H members increased their skills in leading others by participating in a variety of county programs. One county successfully employed 8 County Youth Council members to plan and conduct an officer training which was attended by 69 youth and 27 adults. The attendees reported increasing their knowledge related to leadership. Four counties collaborated to create a long-term team building program for their teen members. This program created a cohesive team that was able to work cooperatively to serve as camp counselors for younger 4-H members. Several counties reported a large increase in the number of teens serving as camp counselors. As a result of their service as camp counselors; most of the teens reported an increase in leadership, communication, service and interpersonal skills.

Skills for Work and Family Life Success Stories

Improving Agriculture/Environmental Awareness and Animal Skill Skills

4-H Programs across Florida employed a variety of methods to teach animal science topics to non-traditional urban and suburban 4-H youth in 2004. Special group teaching events throughout the state let non-farm young people experience hands-on learning about animals and their place in the environment and society. State-wide, 4-H agents conducted 174 programs to teach animal science or agriculture literacy subject matter to Florida's youth.

Agriculture and Animal Projects provide an avenue to learn leadership, responsibility and express compassion, tolerance and exposes youth to diverse populations with the help of caring adults. Traditional 4-H groups like 4-H Horse and Livestock clubs are reaching out to urban clubs to expose new audiences to animal science education. For instance, this year

- 4-Hers with Downs Syndrome raised their first hog.
- a 4-H school club in an urban area raised a pig and a goat at school for the first time. 4-H volunteers demonstrate their care and support of young people and work to accommodate children and families with special needs in their animal projects.
- a young man named Jake fell in love with cattle when his 4-H club leader introduced him to a steer project. Jake's father is confined to a wheel chair and is unable to assist Jake in his animal projects. Several 4-H volunteers have allowed Jake to house his steer projects at their farms and include Jake anytime they are working cattle or other farm projects. Jake has developed an enthusiasm for livestock that is palpable, and he has developed a strong, positive relationship with four caring adults.
- six trained 4-H teens implemented a new school enrichment program on bugs and plants for at-risks kids. The youth participants got to exhibit their project work at the county fair and the classroom teacher expressed this comment "this hands-on experience was more valuable than the FCAT curriculum!"
- a diverse group of urban and sub-urban youth ages 8-12 met for one week to investigate the role of animals within society (companion, work, and production).
- young people who completed the "All About Animals" and "The World of Animals" curricula learned and understand the basic roles that animals play in people's lives and how to be responsible caretakers of animals.
- urban youth in the 21st Century Afterschool program learned about pork and swine using educational models of pigs that were sewn by FCS volunteers. These educational models were then transported and sold at auction at the County fair. The youth experienced public presentation skills and knew that this fundraising effort would be for them to participate in the summer 4-H camp. All youth gained knowledge and self-confidence in subject matter, youth-adult relationships and community relationships.
- At learning opportunities like a visit to a "pizza garden", and at events like "A Day at the Ranch", "From Farm to Table", and other Ag-in-the-Classroom teaching events, young people are exposed to livestock production and gain an understanding of where their milk, meet, and other animal products come from. In one county, 385 youth participated in camping programs to improve their knowledge of environmental awareness, aquatic systems, animal care and agricultural products

Improving Family and Consumer Science Skills

Youth successfully learn a variety of life skills ranging from leadership and confidence to succeed as a result of EFNEP youth opportunities to managing their money through 4-H projects. For example:

- Chris Clark got his start in 4-H in a community EFNEP club. Because of his outstanding accomplishments in 4-H, he was selected to represent the State of Florida at the 35th EFNEP Anniversary Celebration in Washington D.C. Chris Clark is an exemplary 4-H member. He has attended National 4-H Congress, participated in County, District and State Events and served in leadership roles as a 4-H Teen Leader at many 4-H events.
- After participating in a session on using food dollars wisely, 7 out of 10 youth were able to eat lunch for under $5 and 10 out of 10 ate lunch for under $6.
- "Money is more valuable than we think" - A comment from a youth participating in one of four 4-H Money Camps (three day camps) held in one county. Seventy-two youth attended these camps held at various locations. Funding in the amount of $2980 was obtained to support these camps. Eight businesses and financial institutions provided field trip experiences. Sixty-two volunteers assisted with "On My Own", a real world simulation activity held at each camp.
- "On My Own" financial workshops were conducted for 330 students. An end of the class survey indicated the following: 54 of 58 were able to make 10 necessary purchases and stay within the given budget; 52 of 61 gained new knowledge on the correct way of writing a check and a complete understanding of gross and net pay; 100% indicated they learned how much it take to live and gained a new appreciation of what their parents bills.
- High School Financial Planning Program was introduced to Duval County in 2004. 23 teachers were trained to conduct the 10-hour financial literacy program. 500 youth participated in public and private schools, home school co-ops and youth groups.
- 5 foster-care teens opened Individual Development Accounts to save $1000 in a 2 to 1 matched savings account to prepare for independent living as a result of financial literacy series.

Improving Science and Technology Skills

- The Junior Master Gardener Program takes science and service into classrooms with hands-on activities. In one county Master Gardeners worked with 5 schools, 14 classrooms, and 273 youth. Pretest scores went from 56% and to 89%, a 33% increase in knowledge. Teacher survey approval rating was 96%. Students received 568 golden ray awards which translate to the number of units completed. As service projects, students made cards for children at Wolfson Children's Hospital, wrote letters to servicemen in Iraq, picked up trash at schools.

- In 2004 Charlotte County was ravaged by hurricanes. Schools were severely damaged and students needed a facility to use. Sarasota County partnered with Charlotte County to bus students in to Sarasota County to Colonial Oaks Park for classes. Sarasota County Extension staff taught science classes to 250 children over a two day period. NBC nightly News highlighted this unique effort.

Focus 2

Historically, 4-H is based in community club work. Over the years, 4-H in Florida has expanded to reach youth through a multitude of delivery systems, some of which are after-school programs, school

enrichment, and advisory committees. Counties across Florida reported 1,213 organized groups with youth participation in 2004 program year. This number includes 1,120 4-H community clubs, 44 in-school clubs, 41 after-school clubs and 8 military base clubs. The foundational 4-H experience is the community club, but professionals have expanded a successful method by adapting it for schools, after-school and military bases.

Pinellas County, a large urban county has an active 4-H After School Program at 16 sites with 17 groups studying nutrition and fitness, plants and money management. Oakcrest Elementary School in *Marion* County has a 4-H club that meets twice a month after school. This school is has a high percentage of at-risk youth. As a city club, this group has been raising a lamb, hog and growing a garden. They are also learning about Consumer Choices through a focused curriculum. In the past year, the minority enrollment of this club has increased from 3% to 31%, largely due to the support of the principal including 4-H as part of the school day.

The state of Florida is home to 5 Air Force bases. New partnerships with the Air Force have given Florida 4-H a new audience and organizational strategy for the 4-H program. Prior to grant and training support for the program, Florida 4-H had 1 club with 7 youth. As a result of efforts in 2004, Florida 4-H now has 16 clubs involving 201 youth and 33 adult volunteers. 4-H at MacDill AFB in Hillsborough County started with one club at the School Age Center. In 2004 they trained 3 volunteers and served 19 youth. Youth did community service projects, and took care of the center rabbit for their rabbit project. One volunteer from the center participated in the State 4-H Leader Forum and also attended the Regional 4-H Volunteer Forum at Rock Eagle. Okaloosa County Air Force partnership serves Eglin AFB and Hurlbert Field with 52 youth involved in 4-H clubs. Tyndall AFB in Bay County presented a Consumer Choice program to the Youth Center reaching 106 youth. Patrick AFB in Brevard County held skill-a-thons for their after-school youth and youth also participated in the county fair.

Another focus of program organization is the use of youth and adults in program evaluation, and planning through Advisory Committees. This past year staff reached 3,270 adults and youth with Advisory Committee meetings. These meetings involve the guiding staff in the development of county local programs. In many counties, youth are involved in the 4-H Advisory Committee and/or 4-H project committees such as the 4-H Horse Advisory Committee. Not only do youth learn project life skills, but that also have the experience to participate in meetings and committees and learn how to work together with others in developing programs. Reaching out to the Hispanic community, Marion County in their program efforts located volunteers for a local club also tapped a volunteer to serve on their 4-H Advisory Committee. The 4-H Advisory component of the 4-H organization structure strengthens Extension's efforts to meet the needs of the community.

Focus 3

Youth/Adult Partnerships/Teen Leadership

Teen leadership training prepares and empowers motivated teens to effectively participate in youth/adult partnerships, encouraging youth to become leaders and positive role models in their communities. During 2004, in Florida, 1,393 youth volunteers and 45 youth-adult partnerships were reported. In one county, 32 teen volunteers were trained to conduct various educational programs, and 100% felt they improved in self-confidence and in teaching style. In addition, teens have provided science instruction to students at a local elementary school for five years.

Teens have also been trained to be camp counselors, volunteering hundreds of hours during 4-H day and residential camps. Camp counselors developed various lesson plans for teaching to campers.

In one county, 13 teen volunteer leaders developed and presented programs to civic and community

groups to promote 4-H, recruit adult volunteer leaders, and garner community financial support. As a result, four new leaders were recruited and a $200 donation was made.

As a final example, nine teens were actively engaged with adults in monthly horse project committee meetings, which included, among other responsibilities, planning and implementing the yearly program and conducting horse shows.

Volunteers

In 2004, 13,100 adult and 1,393 youth volunteers were reported for the Florida 4-H program. In one county, adult and teen volunteers contributed over 10,980 hours. This is a value of over $83,000 to the community (based on the current Independent Sector rate). In another county, 3,956 volunteer hours were reported. In one small, rural county, 24 volunteers contributed over 3500 hours to the 4-H program.

Goal 4

Focus 1

Commercial Horticultural/Urban Forestry Services

There were 109 educational programs conducted for the commercial horticultural and urban forestry service providers with more than 265,000 individuals in attendance. As a result these service providers are able to correctly calibrate irrigation systems, follow pesticide labels, match plants to site conditions, perform basic pest identification, utilize appropriate pruning techniques, select appropriate plant species for landscape design requirements, utilize integrated pest management strategies, utilize appropriate fertilizer applications for the specific site, and utilize appropriate accounting and business procedures. This has resulted in decrease use of water, pesticides and fertilizers in the maintenance of landscapes.

Specific Examples:

An IPM of Ornamental & Turf Pest Workshop evaluation recorded that 90% of the participants feel more confident about using IPM within the landscapes they maintain; 95% felt more confident about identifying certain ornamental insect pests; and 82% now feel more knowledgeable about common sense grub and mole cricket management.

An evaluation for a workshop conducted on Ornamental Pests for Tropix, Inc. recorded that 96% of the participants felt they had increased their knowledge of ornamental pest identification and 63% felt that would adopt at least one new management technique highlighted.

100% of green industry professionals taking the 8-hour class and licensing exam afterwards passed and gained their pesticide license.

Over 50 individuals trained on proper pesticide use. Over 40 passed their certification test on the first attempt.

Condo Exotic Plant Removal and Renovation: 6 members of a condominium association renovated a 2000 square foot common area invaded by exotic plants, mainly Brazilian peppers. They paid for removal of the exotics. In consultation with agent and IFAS resources, they learned how to and executed a successful renovation project: performed a site evaluation, and selected a mix of native and non-native plants suited for the site. The renovation is aesthetically pleasing and maintenance needs are low.

An Urban Forestry Workshop evaluation indicated that 100% of the participants felt that they increased

their awareness of choosing, planting and establishing trees; 96% have an increased knowledge of root growth; 92% have an increased awareness of Urban Forestry Design; 96% felt that they have an increased knowledge of tree structure; 85% felt that they have an increased awareness of developing a tree management program; 96% felt that they plan to adopt at least one new technique.

In 2004 our pass rate on the limited commercial horticulture exam was: English class: 12 passed of 14; Spanish classes we had 13 of 17 pass. In 2001, there were no Hispanic pesticide certificate holders. In 2004, 46 (35%) of the 130 Limited Commercial Landscape pesticide certificate holders are Hispanic!

An evaluation of a Commercial Program on Plant Disease indicated that 99% of the participants felt an increased understanding of plant disease identification and biology; 92% of the participants felt that they have increased their knowledge concerning the basic causes of plant disease; 92% also felt that they have an increased understanding of plant disease management options; and 79% plan to adopt at least one new Plant Disease Management Technique

A Commercial Basic Pruning Workshop pre/post test recorded an 18% increase in knowledge. An End-of-Program Evaluation indicated that 100% of the participants feel more confident about making proper pruning cuts; 100% now feel confident about training small trees; and 87% now plan to adopt new palm pruning techniques.

25 landscape maintenance professionals received certification in Green Industry BMPs and increased level of professionalism.

28 Athletic field managers who attended a field day, cosponsored by Extension and private industry, learned recommended maintenance practices and costs so can create budgets to obtain needed funds.

L&O, GHP, & Core PCO Regional Training on February 12, 2004 - 48 responsed of 55 - program rated 9 out of possible 10 - 81% felt would save money if implemented a practice suggested - 96% felt they learned something that would be helpful to their business - 95% will be sharing information -48 Limited L&O CEU's granted - 52 Core CEU's granted - 33 GHP CEU's granted55 attended 50 responded to survey81% said would save money95% said would share info

BMP's of Mulching, Mowing & Pruning Presentation at L&O, Limited L&O, & Core PCO Regional Training on October 21, 2004 - 10 responed out of 19 - program rated 9.2 out of possible 10 - 90% felt they had learned something that would would reduce the amount of chemicals or water they used in their business if they implemented a practice suggested - 100% will be sharing information -19 Limited L&O CEU's granted as a result of this presentation

Recognizing Insect Damage on Ornamentals Presentation at L&O, Limited L&O, & Core PCO Regional Training on October 21, 2004 - 11 responed out of 19 - program rated 9.9 out of possible 10 - 100% felt they had learned something about insects that would would reduce the amount of pesticides used in their business if they implemented a practice suggested - 100% will be sharing information -19 Limited L&O CEU's granted as a result of this presentation

BMP's of Mulching, Mowing & Pruning Presentation at L&O, Limited L&O, & Core PCO Regional Training on December 21, 2004 - 29 responed out of 37 - program rated 8.9 out of possible 10 - 93% felt they had learned something that would would reduce the amount of chemicals or water they used in their business if they implemented a practice suggested - 100% will be sharing information -37 Limited L&O CEU's granted as a result of this presentation

Recognizing Insect Damage on Ornamentals Presentation at L&O, Limited L&O, & Core PCO Regional Training on December 21, 2004 - 27 responed out of 37 - program rated 8.7 out of possible 10 - 93% felt they had learned something about insects that would would reduce the amount of pesticides used in their business if they implemented a practice suggested - 100% will be sharing information -37 Limited L&O CEU's granted as a result of this presentation

Focus 2

Florida Yards and Neighborhoods

Educational programs (57) were conducted for more than 250,000 individuals. As a result of these educational programs, youth, adults, and communities have been made aware of efficient use of inputs for landscape management, reduced water, fertilizer and pesticides, proper landscape management, and efficient use of irrigation. The adoption of these practices will result in reduced non-point pollution of groundwater and run-off.

Specific Examples:

43% of participants believe that FY&N principles saved them time. 34% believe that FY&N practices saved them money over previous practices, 39% spent about the same and 3% spent more money.

48% of participants at FY&N programs surveyed will use slow release fertilizer, 41% will identify and remove invasive plants, 14% began composting, 19% increased grass mowing height, 24% no longer us Cypress mulch, 32% group plants by water needs, 44% choose plants for site and water conditions.

Workshop on 'Simplifying Landscape Management' with a Doral Homeowners' Association (270 households)resulted in them replacing their previous landscape contractor [pesticide applications with no 'keep-out' postings] with a landscape maintenance company which uses mowers calibrated at 3" for a more drought-tolerant, pest and weed resistant lawn. A referral to have their irrigation system calibrated by the Mobile Irrigation Lab resulted in water savings of over 400,000 gallons/year.

Two Cudjoe Key Master Gardeners logged in 100 hours in educating local residents about invasive exotics plants in their community. They worked with the local utility company and Nature Conservancy to remove and coordinated work days with the local community to cut down and herbicide the existing invasives. Currently, they are developing a Florida Keys landscape demonstration site with native landscape plants.

Water-Wise Workshops: provide information on water conservation and management in the landscape. Knowledge Gain was measured Before and After the workshop on a scale of 1 (lowest) to 5 (highest):Lawn Care 2.2 (before)/4.2 (after) Xeriscape 2.0 (before)/4.2 (after)Irrigation Management 1.8 (before)/4.2 (after)Micro-Irrigation 1.5 (before)/4.2 (after)100% responded that the workshops met their expectations and that they would recommend it to family and friend.

A survey of UF/IFAS recommendations practice change adoption by the Village of Biscayne Park Public Works Department indicated: an increased use of drought tolerant plants, slow release fertilizers, and increased mowing height.

FYN Landscape Design Workshops: Participants are post-surveyed on 31 indicators of behavior change. Significant changes: 53% say they practice right plant/right place; 77% use a rain gauge; 50% say they water "as-needed." 63% say they fertilize appropriately with slow-release fertilizers; 63% mulch; 57% practice IPM; 63% created habitat for wildlife. 100% were satisfied with the program; 100% said they had shared information with family and/or friends.

Florida-Friendly Landscaping 101: Five Florida-friendly presentations were made; seminar was evaluated for knowledge gain afterwards on a scale of 1-5. All presentations showed increases of 1.7 to 2.3. 79 said they intended on making changes to their landscape; no one said they would make no changes.

The Madera home development in Southwest Gainesville is a "green community". All of the 88 home sites in Madera will have Florida Yards and Neighborhoods design landscapes. With the development of

the model center landscape the target audience in Alachua County will be able to see and experience what a FYN landscape looks like and how it functions. The signage at the site lends itself to using the model home as a outdoor teaching area, and a passive demonstration. This site was visited by over 300 people during the parade of homes and has been the site of 2 waterwise seminars, 2 agent training seminars, and a Master Gardener training class.

Protecting Florida waters from non-point source pollution is the major thrust of the Florida Yards and Neighborhoods program. Alachua and Gilchrist county are home to some of the most visited and treasured springs in the state. The springs offer a looking glass into the over all health of our water system. As development of new homes extends toward the spring area and Sante Fe River basin it is imperative that homeowners understand their potential landscape pollution impacts on the springs. A FYN seminar was presented to the residents of Spring Ridge neighborhood (100 home sites), to educate 25 homeowners on putting the right plant in the right place, reduced pesticide use and using slow release or no fertilization in this very sensitive spring area. This seminar was the result of partnerships for with Suwannee River Partnership, and the Sante Fe springs working group.

46 FYN programs were held at which 1,346 people attended. 892 responded to an exit survey indicating: 862 (97%) were satisfied with the program; 400 will water more efficiently; 137 will reduce runoff; 117 will protect the waterfront; 455 will use right plant right place; 347 will fertilize appropriately; 251 will recycle; 175 will use bi-product mulches; 268 will manage yard pests; 270 will provide for wildlife.

46 FYN programs were held at which 1,346 people attended. 892 responded to an exit survey indicating: 25% will decrease fertilizer use; 35% will decrease pesticide use; 29% will decrease water use.

Focus 3

Residential Landscapes

More than 160 educational programs were conducted for more than 1 million individuals. Residents are taught environmentally friendly landscape methods, landscaping methods for enhancing wildlife in urban settings, efficient use of inputs for landscape management, decreased landscape costs, pesticide usage, disease problems, and inefficient use of water. In addition this focus area also involves the training of Master Gardeners who assist within the county extension offices and community in making landscape recommendations, do soil testing, identify pests and develop demonstration gardens throughout the community as well as working with school gardens. These programs reduce pesticide usage, water usage, and fertilizer usage for home landscapes and gardens. They develop a cadre of speakers to speak to community clubs. School garden programs assist youth in developing leadership and life skills.

Specific Examples:

Pinellas County Master Gardeners volunteered a total of 27,814.5 hours at a value to the county of $478,131.26 at the current volunteer value/hour rate of $17.19.

MGs designed a Therapeutic Garden at Upper Pinellas Association for Retarded Citizens(UPARC), and solicited donations and volunteers to build the garden. May 2004, MGs and community volunteers completed a Therapeutic Garden at UPARC. Twelve Master Gardeners secured approx $10,000 in donations consiting of cash, plant material, garden hardscape, and food for volunteers along with 28 additional volunteers. The garden was built at no cost to UPARC.

Over the last three years, Volusia County has offered 2 BMP classes/year, resulting in significant number of county, city and educational institution landscape maintenance personnel to complete the program. Results were: reduced water use, better plant selections, more effective pest control, working closely with

a city employee on landscape projects,irrigation designer/installer has completed the Master Gardener program and numerous CEUs available for various professional certifications.

Special Gardens Day Long Short Course on February 13, 2004 - 44 of 83 responded - Program ranked 9 out of possible 10 - 96% felt they learned something that would cause them to change the landscape design - 91% felt they would now try a plant they had never planted before - 98% felt their landscape would be made more attractive as a result of something they learned - 98% will be sharing info learned with someone

Distributed 222 compost bins. Of those surveyed 75% used the bins and saved an average of 3 yard debris bags/bin/month. This is equivalent to saving 5,976 yard debris bags from going to the landfill this year. Material composted on site can be used in the landscape conserving water, increasing plants growth with slow release nutrients and replacing need for chemical fertilizers.

Gardening with Critters and Without Chemicals Day Long Short Course on March 13, 2004 - 56 responded out of 79 - Program rated 9.5 out of 10 - 98% learned something that will cause them to use less chemicals - 91% learned about a plant they will now try to grow - 96% will now be more tolerant of spiders in the landscape - 100% will share info learned with someone else

At Regional Training for New Master Gardener Volunteers did Attracting Wildlife for Master Gardeners Presentation on October 20, 2004 - 87 out of 101 responded - Program was rated 9.2 out of 10 - 96% said they learned something that would help to atract more wildlife to their landscapes - 100% would be sharing info

At Regional Training for New Master Gardener Volunteers did Growing Deciduous Fruiting Plants in NE Florida Presentation on October 27, 2004 - 91 out of 101 responded - Program was rated 9.1 out of 10 - 82% said they learned something that would cause them to a fruiting plant they do not currently have - 100% would be sharing info

Simply Southern Garden Guide was offered to more than 1800 people in 3 states. The full color book extends UF IFAS recommended horticulture practices to residents and gardeners.

The Lake County Master Gardener Office Plant Clinic reported more than 60,000 contacts from call ins and walk in clientele. The Mobile Plant Clinic was utilized 18 times at varies sites with in the county. The Mobile Plant Clinic was awarded the 2004 Achivement Award by the National Association of Counties for innovative programs which contributes to and enhances county government in the United States.

Due to the Invasive Species teachers workshop, over 2,379 children will be taught the curriculum. 100% of the 27 teachers stated that they increased their knowlege and all agreed to teach their students the impacts of invasive species and how we can reduce the incidence of introducing species that pose a risk to agriculture and natural resources.

Based on independent surveys, over 400,000 people read the agent's newspaper column each week. Total estimated contacts were 23.2 million for 2004 (not including radio, newspaper, or t.v. interviews or the agents t.v. shows). Based on the agent's survey (2000), 80% reported practice changes, 92% gained knowledge.

If all recommendations from the 64 landscape/irrigation evaluations were followed, each property would realize an average monthly water saving of 5,700 gallons per month or an annual water saving of 4.3 million gallons anually.

The total number of hours volunteered by the Master Gardeners was 3,756 for 2004. Value of over $64,566 ($17.19 per volunteer hour, National figure for 2003).An average of 84 hours per veteran volunteer (43 veterans).80% (16 of 20) new Master Gardeners started volunteering within 1 month of the completion of coursework for a total of 146 hours.The number of actively volunteering MGs increased

from 25 (in 2003) to 61 (in 2004).In the class of 2003, 75% (18 of 24) homeowners who completed the course.

Majority of those surveyed (94%) stated they have gained appropriate knowledge to help them make better decisions about managing and maintaining their landscapes.

In cooperation with USDA and Florida Dept of Agriculture-DPI, the agent released a "decapitating" fly to control fire ants in 2003. The release site was monitored and mass media outlets were contacted. After just 2 weeks after the release of the flies, the number of fire ant mounds decreased by 75%. Six months later, almost all mounds are gone within 1 mile of the release site. Once fire ants are under control, county residents will save up to $6 million per year in fire ant control.

Through the Adopt-A-Tree grant to help reforest the county, over 18,000 trees were distributed to homeowners. 22,600 people learned how to properly plant and maintain their trees. 27,146 publications were distributed.

In a recent study by American Forests (the nation's oldest public nonprofit conseravatopm grpi[based om Wasjomgtpm D/C/), the following dollar-value enefit was calculated for mature tree in one year: Air conditioning: $73, Controlling Erosion and Stormwater: 475, Wildlife Shelter: $75 and Controlling Air Polution: $50. This totals $273 a year. In our program "All About Trees" we provided participants with 48 trees which they subsequently planted in their yards.

The 2004 Landscape Gardening Series reached 411 particpants with new information on Florida Gardening. One evaluation of "Landscaping with Tropical Plants" indicated that 87% they are more aware of the selection of tropical plants, 76% feel more confident in growing and including tropicals in their landscape; 87% can now identify three new tropical plants; and 86% now plan to plant at least one new tropical.

110 Master Gardeners were trained. 97 of them were recruited. Each one of them spent more than 4 hours/week and more than 30 weeks/year for a total of over (97 x 4 x 30) 11640 hours helping me and the other agents in Charlotte, Collier, and Lee counties with this program. Their “In Kind” contribution exceeded (11640 hours x $16.54/hr) $192,525.

Gulf Coast Gardening from the Ground Up, a series of gardening classes for the public, was offered to meet the growing interest in gardening and landscape management. At the conclusion of the seven classes, 242 participants completed an evaluation with 99.6 percent indicating that the class helped them become better gardeners. Ninety-seven percent of the respondent said they changed some of their gardening practices as a result of a class.

Goal 5

Focus 1

A young mom participating in my 6-session parenting class at a residential drug facility stated, "I've taken 8 weeks of parenting classes (at another agency) and I have learned more today than I did in those 8 weeks of classes. I'm going to keep coming." Several weeks after reuniting with her young son she reported successfully using the positive parenting techniques learned in class.

26 child care professionals and 113 parents report an improved educational atmosphere in the center and/or home because of changes they made, including re-arranging the training room, purchasing a variety of educational toys, planning self-learning experiences for children, and creating a daily schedule that is more conducive to early childhood development.

Elderly couple who had lived together for twelve years saw information about marriage prep in the newspaper, attended class, and decided that it was time to marry. They came to see me following the ceremony to say that they probably would not have had an incentive to be married if they hadn't gone through the class and were very happy that they did.

After completing a 6-session parenting class, a mother wrote this comment, "One of my daughters always has trouble in math. I used to jump all over her like put her on punishment, so now I talk with her. I used to yell at her, so now I talk with her in a more healthier way."

Followup indicates that divorced parents are trying hard to co-parent after learning strategies in the class for divorcing parents. The local circuit judge sees a better spirit of cooperation between parents who have attended the class. He even sends parents who were divorced prior to state class requirements and who continue to come before him with unresolved conflict. Quotes from parents include: "I am setting more realistic goals for my child and more realistic rules for him to follow."

One parent stated that prior to attending the class, he nagged his teen about everything. He wondered why his son forgot many things and never seemed to be able to make the types of decisions he expected him to. He said that, as a result of learning about adolescent brain development and the reasons teens behave the way they do, he was better able to work with his son and their relationship had improved.

Two hundred fifteen parents (12 male, 211 female) enrolled in the five-week Success and Single Parent learn-by-mail course. Eighty-eight particpants (41%) returned survey at end of course. On average 66% stated their knowledge about money management increased; 77% stated knowledge about ime management had increased; 63% stated knowledge about communications increased; 74% stated knowledge about child behavior increased, and 66% stated knowledge about caring for oneself increased.

Focus 2

"Money Mechanics" Learn-by-Mail participant: "I have been recently widowed and my husband had always 'handled' the money. I have found this course an excellent place to begin. Knowing the numbers & information in my head is not as efficient as writing it down. Your (budgeting) charts are an excellent way to do that. I feel like I have better control over my finances & that my decisions are not random choices - they're 'financial decisions.'"

After completing a 4-week money management class, one participant stated, "This has helped me deal with money issues with my spouse." Another class participant reported, "I plan to clear my credit and rebuild it, this class has taught me usful ways to deal with money."

"Money Mechanics" Learn-by-Mail participant: "I'm saving in my 401(k) as well as stock purchase plan. I developed a budget with my children. I've now given my children 'their' money to manage to buy their clothes and wants. I see a difference in their attitudes about money. I now determine what I'd rather spend $1 on, because it does add up!"

Participants indicated on follow-up surveys the following practice changes they have made in their financial management habits:"We cut back a lot on unnecessary spending and have begun to pay off a lot of our debts." "We watch our money closely and determine between 'needs' and 'wants.' We have started making long/short term goals and saving to achieve them." "Now I think or make plans before I spend my money so I will be able to pay for my house.""My main goal is to pay off my credit cards."

This success story started in 2002 when a couple attended the home buyers education classes. The couple was on public assistance, with very little income and lots of debt problems. Ater the home purchase class the couple made an appointment for individual help with a spending plan to reduce their debt. A year and half later the couple was approved for a home loan and in 2004 are in there home. Couple has greatly reduced their debt and two years later are still following their spending plan.

Three ninety eight consumer completed the 8 hour homebuyer workshops on budgeting, saving, credit management,and buying a home. Thirty two persons were able purchase their first home.

A single mother of four (minority), limited income, got trapped in a home-buying scam. Client signed a blank contract to build a house. The proposed house payment was twice normal amount and client could not afford it. The client tried to get out of contract but was told she could be sued for $25,000 if she did. The company offered to “settle” for $2,000. The Agent helped client get the information needed to determine that the contract was not legal and a scam, thus saving client $2,000.

When participants were asked to describe one specific way in which they have changed or the family has benefited from participation in the program, representative responses were as follows:- It made me focus on getting my credit cards under control.- I am now more conscience about my spending habits and enjoy budgeting.- Realize not to use credit, spending tomorrows income today.- I will be more careful how I spend my hard earn money.- It made me finally start to pay off my accounts.

Focus 3

Success Stories for Nutrition, Food Safety, and Health

The use of cost effective strageties led to the reduction of food costs for EFNEP families. The average reduction in food cost of $2.12/family each month indicates that an overall monthly savings of $2223.88 occurred with a yearly reduction in food costs of $26686.56. As a result available additional dollars allowed families to purchase, prepare and consume more healthy foods.

When asked if, as a result of the Food Safety Training Workshop, their establishment would benefit financially (based on the fact that a foodborne illness outbreak can cost an establishment thousands of dollars) 95% or 152 of 160 participants responsed "yes". Comment from one foodhandler attending the training: "It taught me a lot of things that I did not even know. It is good. Thanks a lot."

Eighteen pregnant teen students changed their behavior and attitude concerning overall nutrition for themselves and infant. Changes included consuming more milk products and fruit and vegetables, and decreasing the amount of junk food in their diet.

Elderly minority community commented on the effects of the program by applying the food label lessons to everyday nutrition. They are now more aware of how to read the amount of fat, cholesterol, sodium and carbohydrate content in food and are modifying their diet according.

Mrs. G attended our "Cooking Healthy with Diabetes" course. She stopped by the office to share with me her successes. She had lost 25lbs. She also had gained control of her blood glucose level and reduced her A1c blood test. Her doctor asked her how she had accomplished these goals. She told him it was a result of taking our course.

After teaching a series of Snack Smart Move More classes to a group of 20 elementary children, the teacher reported that 2 parents had called to tell her had reviewed the family materials the chidren had brought home. As a result of their children's enthusiasm and the new information they were planning healthy snacks. For the 1st time this school year a parent supplied the class with carrots (as an alternative to cookies, candy, etc) for the daily snack.

EW an 80 year old male retired physician, states that he has noted his blood sugar is better with regular meals. He has become more aware of eating cues and has seen the benefits of keeping a food record. His attitudes have shifted to enhance a more positive perspective. He self reports knowledge gained in areas of body image, eating cues, attitude, outlook, responsibility for eating habits, eating habit discipline and the benefit of humor. He is using positive self talk to control eating

A mother attended the August 6, 2004 activity on "Back to School Lunch-Managing Resources". She states the family is often in a hurry. Her child brings his lunch to school with him and was coming home with most of his lunch un-eaten. After attending the educational session, she changed her behavior. The

mother involved her child in the meal selection process and started having her child help pack his own lunch. As a result of his involvement, his lunch bag is coming home empty.

As the result of the overall training, Master Food and Nutrition Educators gave an 85% confidence score to their ability to assist the public with technical information.MFNE rated the effectiveness of the overall training at 97%.100% of volunteers rated Dorschel's presentation and teaching methods as very effective; 95% felt the sessions objectives were met; 82% rated their ability to address the topics with the public as "very confident" as a result of the agents sessions.

32 culinary camp youth increased knowledge of basic food safety, nutrition and food preparation information by 63%. 100% learned new skills. A mother called recently and told us that her 13 year old who was in last summer's camp has had a complete attitude change as the result of camp. She now spends much of her free time in the kitchen and even started a business at Christmas by baking and selling 17 cakes.

The Miami-Dade Community Action Agency Family and Child Empowerment Program, is very thankful for the UF/Extension Family Nutrition Program teaching the at risk youth healthy eating habits. Nutrition classes have helped them with reading, food preparation and self esteem. Many say they have stopped eating too much junk food and started eating more fruits, and vegetables. Staff has been trained to use the materials left with us to teach the children.

Focus 4

739,530.51 was added to the Levy County tax base through the addition of the 22 homes through the Levy County SHIP Program during their last fiscal reporting year of July 1, 2003 through June 30, 2004.

When Tamre first came to an individual appointment, she was determined to buy a home. A single mom, a Collier County teacher, she knew she would have many issues on her credit report and a challenge to save money. In six months time, Tamre took our class, paid off her debts, cleaned up her credit report and closed on her condo. Tamre was one of 323 clients to participate in our Home Loan program this year. She is one of 29 who purchased through our home loan program.

A Jackson County couple debt load was to high for them to qualify for a home loan. They decided to discuss their problem with the Agent. They completed a Record of Spending, and listed everyone they owed. Two changes they made were stop using credit cards and pay all bills on time. They worked on paying off the higher interest rate cards first. After a year an a half, they were able to qualify for a home loan. Today they are in a home and are still practicing a budget.

168 new residents to south Florida, residing in the Bellagio Estates in Lantana, attended a Closing Your South Florida Home. Each residence had a parallel wired humidistat. Following the presentation, 92 of 144 surveys at the end of the meeting indicated that they now knew how to properly set the humidistat to control humidity to prevent costly damage from mold and mildew.

Goal 6

Focus 1

During Hurricanes Frances and Jeanne, the Large Animal Disaster Committee was able to readily see the success of the educational efforts they have made over the past few years. During the threat of Hurricane Georges in 1998, the committee sheltered over 600 animals. In 2004 the request for shelter were very minimal. Hurricane Frances resulted in 26 animals sheltered with two other groups sheltering

approximately 70 animals. For Hurricane Jeanne there were even fewer animals sheltered.

Desota County Extension Office became the operations center for the ESF-17 distribution and coordination. Emergency Operations briefings were held for 58 days, the majority of which were morning and evening briefings. In his absence meetings were attended by Dallas Townsend or Christa Carlson. Total donations for the ESF-17 effort were estimated at approximately $114,000. Between August 16, 2004 and September 7, 2004 (23 days) 518 individuals were assisted with animal related needs.

Focus 2

By learning how the Enterprize Zone incentive program works, five new businesses and two existing businesses received $449,204 in tax incentives for locating or expanding their business in Gadsden County and/or hiring residence of the Enterprize Zone or the rural area.

Learn by Doing Affordable Homeownership OUTCOME: Neighborhood developed called M___ Place for 26 credit worthy, minority families eligible for private financing of #130,000 homes brought down to $75,000 in the most visible, blighted area in Immokalee. The Empowerment Alliance of SWF, which is also a Community Development Dorporation, with board partnering since 1999 from Extension leveraged an infill grant and CDBG/HOME funds of $2 million.

Affordable Homeownership: Extension Homeownership education funded with $20,000 in private funds began over three years ago and eventually prepared 28 creditworthy families. The norm here is three out of a 100 interested at a previous offering were even marginally ready. One year of credit building and usually two are required to be eligible. CRD IMPACT: Social: pride, sense of place, ECONOMIC: wealth formation where one third of dwellings are owner occupied. Norm is two thirds.

Focus 3

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Focus 4

In Florida between 1999 and 2003, the numbers of agriculture occupational nonfatal injuries and illness decreased by 51%. In 1999, the number of recorded nonfatal occupational injuries and illnesses was about 9500 cases, but by 2003 it decreased by 4900 recorded cases (Florida department of Labor).

g. MULTISTATE PARTNERS BY PLANNED PROGRAM

I. To enhance and maintain agricultural and food systems
AL, AR, AZ, CA, CO, DC, DE, FL, GA, HI, IA, IL, IN, KS, KY, LA, MD, ME, MN, MO, MS, MT, NC, NE, NJ, NM, NY, OH,
OK, OR, PR, SC, SD, TN, TX, VA, VI, VT, WI

II. To maintain and enhance Florida's environment
AL, AR, CA, DC, FL, GA, HI, IL, KY, LA, MS, NC, NM, OK, SC, TN, TX, VA, WA

III. To develop responsible and productive youth through 4-H and other youth programs
AL, CA, CO, CT, FL, GA, ID, IN, KS, KY, LA, MD, MO, MS, NC, OH, OK, PA, SC, TN, TX, VA, WV

IV. To create and maintain Florida friendly landscapes: The smart way to grow
AL, DC, FL, GA, MS, PA, TN

V. To assist individuals and families to achieve economic well-being and life quality
AL, AZ, CA, CO, DC, FL, GA, HI, IA, ID, KY, LA, MN, MS, NC, NE, NJ, OH, OK, OR, SC, TN, TX, VA, WA, WI, WY

VI. To achieve economic prosperity and community vitality in Florida's urban and rural areas
AL, CA, GA, MD, VA

VII. To promote professional development activities designed to enhance organizational efficiency and
AL, AR, AZ, CA, DC, FL, GA, IA, ID, IL, IN, KY, MA, MO, MS, NC, NY, OH, SC, TN, TX, VA, WA