

# University of Florida and Florida A&M University Combined Research and Extension Plan of Work 2020-2024

**Status: Final**  
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## **I. Plan Overview**

### **1. Executive Summary**

UF/IFAS - 1862 Extension and Research

The University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) is a federal-state-county partnership dedicated to developing knowledge in agriculture, human and natural resources, and the life sciences, and enhancing and sustaining the quality of human life by making that information accessible. While extending into every community of the state, UF/IFAS has developed an international reputation for its accomplishments in teaching, research and extension. Because of this mission and the diversity of Florida's climate and agricultural commodities, UF/IFAS has facilities located throughout the state – 14 academic departments and two schools based at the main campus in Gainesville, 18 off-campus facilities, and an Extension office in each of Florida's 67 counties. Furthermore, UF/IFAS Extension reaches clients in Florida and beyond via print and online resources.

UF/IFAS provides research and development in support of Florida's agriculture, natural resources and related food industries. Agricultural research means that farmers can produce more fiber, food and fuel with the same amount of land and inputs; for the rest of us, research also reduces food prices, improves food safety and helps protect environmental quality. These industries are an economic powerhouse in Florida, providing more than 2.3 million jobs, \$165.5 billion in direct output (revenues), \$137.2 billion in value added contributions, and accounting for 14.7 percent of total economic activity in 2016.<sup>1</sup> According to an extensive analysis published in 2010 by a team of agricultural economists, for every \$1 invested in U.S. agricultural research and development there is a return of \$20 in benefits from increased agricultural productivity.<sup>2</sup>

The research mission of UF/IFAS, conducted by the Florida Agricultural Experiment Station, is to encourage innovative study, discover new scientific knowledge and create applications for that knowledge to address challenges facing agriculture, natural resources and interrelated human systems in Florida, our country and our world. Specifically, its goals include:

- Expand our global leadership in basic and applied research in agriculture, natural resources and interrelated human systems, to build and maintain programs that conduct impactful research.
- Enrich the culture of research discovery by supporting faculty, inspiring innovation, promoting synergies between the three main UF/IFAS units and fostering effective communication between faculty and stakeholders.
- Build satisfaction and quality of life on the job for faculty and staff by providing training and continuing education opportunities, and by nominating researchers at all career stages for awards, honors and other recognitions.

By seeking ways to enable the success of individual faculty and empowering multidisciplinary teams, we will achieve these goals and will strive to identify and meet future opportunities to further our research mission.

The UF/IFAS Extension mission is to develop educational programs targeting critical issues throughout Florida. These will be achieved by continuing to partner with clientele, volunteers, county governments, and public and private agencies. Teams of faculty and staff statewide focus on seven key areas:

1. Increasing the sustainability, profitability and competitiveness of agricultural and horticultural enterprises
2. Enhancing and protecting water quality, quantity and supply
3. Enhancing and conserving Florida's natural resources and environmental quality
4. Producing and conserving traditional and alternative forms of energy
5. Empowering individuals and families to build healthy lives and achieve social and economic success
6. Supporting urban and rural community resources and economic development
7. Preparing youth to be responsible citizens and productive members of the workforce

Florida Extension (UF and FAMU) has delivered science-based information to foster healthy people, a healthy environment, and a healthy economy for more than 100 years. Florida's economy is based on growth, tourism and agriculture. During the recession our population growth was largely flat, but growth has picked up recently and in 2014 the state passed New York to become the third most populous state with an estimated 21 million in 2017. Florida's population is estimated to reach 27.4 million by 2045.<sup>3</sup> With this growth comes the need for new information on food and fiber production, water conservation, natural resource protection, alternative energy and conservation, community resource development, and individual and family well-being. Extension will continue to improve the lives of Floridians as we face the challenges of tomorrow and beyond.

The goals and key areas outlined above are based on long-range, strategic planning processes by UF and FAMU and designed to address the state's needs. These planning efforts resulted in the Extension Roadmap (2013-2023) and the Research Roadmap (2009, updated annually). For the purposes of this report, the combined research and extension efforts are divided into five critical issue areas [DRAFT, still under review]:

Agricultural and Food Systems  
Water Quality and Conservation  
Natural Resources and Environment  
Nutrition, Health and Food Safety  
Families and Communities  
Youth  
Research for Management of Invasive Pest Species

<sup>1</sup>Court, C.D., Hodges, A.W., and Rahmani, M. 2018. Economic Contributions of Agriculture, Natural Resources and Food Industries in Florida in 2016. University of Florida/IFAS, <http://edis.ifas.ufl.edu/fe1020>.

<sup>2</sup>Alston, J.M., Andersen, M.A., James, J.S., and Pardey, P.G. 2010. Persistence Pays: U.S. Agricultural Productivity Growth and the Benefits from Public R&D Spending. New York: Springer.

<sup>3</sup>Rayer, S. and Wang, Y. 2018. Florida Population Studies, Vol 51, Bulletin 180. University of Florida Bureau of Economic and Business Research. Online: <https://tinyurl.com/ybcxhexy>.

## FAMU - 1890 Extension

Although extension in Florida is made up of a collaboration between the 1862 UF/IFAS Extension and the 1890 FAMU Extension (and together they are the Florida Cooperative Extension Service), they will be reported separately as much as possible to provide a clearer picture of the strong programs and impact FAMU and UF/IFAS have individually on Florida and its citizens. The Cooperative Extension Program is the extension educational component of Florida A&M University's land grant mission. The FAMU Cooperative Extension Program, housed in the College of Agriculture and Food Sciences (CAFS), provides research-based educational information and direct technical assistance to improve the quality of life for limited resource citizens. As a result, countless residents in Florida have been enriched through the positive impact of significant information shared by specialists and agents through the Cooperative Extension Program. Reaching out to serve farmers, rural and urban families, elderly, youth, entrepreneurs, small business owners, and underserved communities continues to be a rich tradition of the FAMU Cooperative Extension Program.

## FAMU/CAFS--1890 Research

Florida is one of the fastest growing states, currently ranking third in population growth after California and Texas. Most of this growth has been taking place in major urban areas, but agriculture continues to play a significant role in Florida's economy. Florida's agriculture is both diverse and unique in terms of farm size, crops grown or livestock maintained, and economic investments. The changing demographics of the state and the consequent needs of our stakeholders dictate that we develop appropriate research programs which would address the key challenges to sustainable development.

Our research programs have a particular focus to the needs of small to medium scale, limited resource farmers and industry stakeholders. Ninety percent of Florida's farms fit the definition of a small farm, which makes our mission particularly crucial in enhancing the overall economy of the state. The major areas of need are captured in the following planned programs:

1. Viticulture and Small Fruits Research
2. Preserving Water Quality of North Florida Watersheds Research
3. Strategic Research for the Management of Invasive Pest Species
4. FAMU Livestock and Crop Improvement Program

Viticulture and Small Fruits Research continues to provide leadership in the development of the grape and wine industry in Florida through quality research and statewide extension and outreach activities that address the needs and concerns of stakeholders. The Viticulture and Small Fruit Center recently released a fresh fruit muscadine cultivar and is working to release several wine grape and fresh fruit cultivars in the near future that will greatly impact the viability of the Florida grape and wine industry. In the area of plant biotechnology, researchers are working to identify molecular markers that will facilitate the breeding program and best management practices to enhance productivity and reduce cost. In the food biotechnology, researchers are working to develop high efficiency technology in the production of phytochemicals and nutraceuticals from grapes to address childhood obesity, food safety and food security issues. As a member of the USDA National Clean Plant Network, the Center will continue to improve on phytosanitary techniques in pathogen testing and disease elimination therapy and the production of clean vines. The Center will evaluate IPM techniques for vegetables and

non-traditional small fruits, including blackberries for North Florida farmers to assist them in identifying alternative enterprises. The viticulture program attracts and supports many students who have chosen to do their research in grapes and small fruits. The faculty shares their expertise, knowledge and experience with the rest of the college by teaching graduate courses and participating in scholarly and professional activities.

Preserving Water Quality of North Florida Watersheds Research is administered through the Center for Water resources. The Center continues to work with undergraduate and graduate students, conduct need-based research and work with the Cooperative Extension Program and the U.S. Forest Service, Southern Research Station, as well as a number of diverse stakeholders. Its programs are focused on water quality, soil chemistry, geospatial technologies and aquatic entomology issues in the Florida Panhandle. Through the planned programs, the Center will continue to provide experiential learning opportunities for students in soils, water, forestry and natural resources areas.

Strategic Research for the Management of Invasive Pest Species is implemented by the Center for Biological Control. The problems posed by Invasive Alien Species (IAS) are broad, with impacts at the local, state, national and global levels. IAS pose major threats to agriculture and the environment. Concerted action and the continuum of prevention of imminent threats to the management of established species is required to mitigate the threats. This program takes a multidisciplinary approach with activities across the spectrum from prevention to management and restoration. The specific areas of focus include offshore pest mitigation, onshore development of ecologically based management of invasive insect pests and weeds, development of electronic diagnostic tools and resources for insect identification, assessment of the economic impact of IAS and improving the safety of biological control. The work of the Center integrates projects funded through other agencies which are all broadly focused on development of biologically based techniques for the management of pests. The program of work involves strong collaboration with USDA APHIS and USDA ARS, several state agencies and international cooperators, especially in the context of offshore work on IAS. An integral component of the research program is the training of undergraduate and graduate students and this emphasis will be continued.

FAMU Livestock and Crop Improvement Program this program is located both at the FAMU Research and Extension Center in Quincy, Florida and Brooksville Agricultural Environmental Research Station (BAERS). Recently FAMU acquired 3,800 acres of land in Brooksville, Florida from the USDA-ARS to support the university's land grant mission. The program at this station will host a collaborative multidisciplinary livestock and crop improvement program that will lead to the acquisition of scientific knowledge that will enable the University/College to assist its stakeholders – the limited resource farmers to enhance productivity and profitability of their farming operations. The program will include livestock improvement, hay production, forage systems improvement, specialized horticultural crops, and best management practices for livestock and crop production. The program will also include the training of new and beginning farmers and ranchers in Florida.

## 2. FTE Estimates

Year	1862 Extension	1890 Extension	1862 Research	1890 Research
2020	450.0	35.0	335.0	30.0
2021	450.0	35.0	335.0	30.0
2022	450.0	35.0	335.0	30.0
2023	450.0	35.0	335.0	30.0

2024	450.0	35.0	335.0	30.0
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## II. Merit / Peer Review Process

The Florida Extension Leadership Team meets monthly to discuss statewide programming, hiring, resource allocation, and professional development. These meetings serve as an ongoing evaluation of the quality and relevance of Extension programs to state program goals as identified by our seven Extension Initiatives. The ELT consists of the UF/IFAS dean and senior associate dean for Extension, FAMU Extension Director, statewide program leaders, district directors, state specialist in program & professional development, and representatives from IT, communication services, human resources, financial services, and county operations. Under the seven Initiatives, we have 23 Priority Work Groups (PWGs). Both UF/IFAS and FAMU faculty serve on these self-directed teams. A program leader provides oversight and guidance to the PWGs. Members consist of both state specialists and county agents together working on program planning and evaluation, curricula development, and assessing the need for new research. PWGs may consult with external stakeholders as needed. Teams provide a plan of work and logic model to their program leader and these are posted online. Periodically, the Initiatives hold formal meetings to bring all the PWGs together to improve the quality and relevance of its Extension programming. UF/IFAS Extension conducts at least five county program reviews per year to insure educational programming is effective and meets local needs. Teams consisting of state specialists, county faculty and Extension administrators and/or unit leads visit a single county. Reviewers look at the strengths and challenges of the unit and its programmatic successes and opportunities, and provide recommendations for improvement in research, teaching and extension.

UF/IFAS (1862) Scientific Peer Review: All USDA funded projects must be submitted to USDA/NIFA using REEport system and must be peer reviewed by three researchers, with final approval from the unit leader. Peer reviewers may be a faculty member of the same department, another department at the university, or from another institution. REEport projects are also evaluated annually by the unit leader and program leaders via the Annual Progress Report, as well as the individual faculty's report of accomplishments and a plan of work for the next year.

FAMU/CAFS 1890 Merit Review: All USDA funded projects are submitted to USDA using the REEport and must be peer reviewed with final approval from the unit leader. Project ideas are developed by faculty in response to stakeholder needs and fall within University and state priority areas and from Center Advisory Councils, as well as link to USDA and state priority areas. A preliminary review is made by the Research Director in consultation with Principal Investigators regarding the relevance and the impact on stakeholders, followed by a comprehensive review by subject matter specialists and at least one external reviewer. REEport projects are also evaluated annually by the unit leader and program leaders via the Annual Progress Report, as well as the individual faculty's report of accomplishments and a plan of work for the next year.

## III. Stakeholder Input

### 1. Actions to Seek

Periodically, Florida Extension (UF and FAMU) conducts a comprehensive statewide needs assessment using several methods that target both traditional and non-traditional audiences, including listening sessions, focus groups, and surveys.

Each of the 67 county Extension offices has a county-wide advisory committee and each county faculty member is expected to have at least one program advisory committee. The membership is expected to resemble the demographics of the target audience they serve and are reviewed as part of the faculty member's annual review.

Academic departments and Research and Education Centers have advisory councils representing agricultural commodities, natural resource organizations, community and business leaders, etc.

The Florida Agricultural Council (FAC) is a non-profit foundation that consists of five regional councils and meets at least once a year to discuss societal trends, educational and technical issues, and economic pressures that affect the ag and natural resources entities in the state.

A Customer Satisfaction Survey is conducted annually of 12-14 counties on a five-year rotation. Survey protocol is available here. These data are reviewed by Extension administration.

County Program Reviews are conducted in five different counties each year to insure the educational programming is effective and meets the needs of the county. County administrator(s) and stakeholders from each of the key program areas are invited to participate and provide feedback about the quality, effectiveness, and relevance of the Extension programs offered in the county. County directors submit a report one-year after completion of the review, highlighting the progress made on three priority items that arose during the review.

## FAMU (1890) Research

FAMU/CAFS has four research centers and the Quincy Research and Extension Center (REC) with advisory committees representing various agricultural industries, community and business leaders. Research advisory committees help to identify ways to encourage participation in long range planning. Input from stakeholders will be sought from multiple sources and at different levels. Various stakeholder groups such as: Florida Grape Growers and Wine Association, Florida Pest Control Association, Florida Department of Agriculture and Consumer Services representative, Florida Water Management District representative, Florida Department of Environmental Protection, and 1862 Land-Grant Institutions are represented in the different research program/center Advisory Councils. Through participation in these Councils as well as in other forums, follow-up discussions will be held concerning the existing research program priorities and how Florida A&M University's research programs are and will be addressing stakeholder's needs. A Research Forum will be held to encourage stakeholder participation and facilitate interaction with researchers. Other public events are conducted to gather information from stakeholders. Whenever it is feasible, efforts will be made to coordinate relevant activities with extension to avoid duplication.

### **2. Methods to Identify**

We identify stakeholders through a variety of formal and informal means, including relationships with Extension clientele, partnerships with collaborating organizations or companies, input from county administrators and other elected officials, advertising and social media, and suggestions from advisory committees and commodity groups. In addition to statewide efforts to identify key issues and stakeholders through our long-range planning process, counties and districts as well as academic departments and Research and Education centers, may conduct their own listening sessions, needs assessments, and surveys to identify stakeholders.

### **3. Methods to Collect**

Florida Extension is beginning to plan for its next long-range plan (current one expires in 2023) and anticipates using a wide variety of methods to collect input from stakeholders, the general public, and non-traditional groups and individuals, including surveys, focus groups and listening sessions. In addition, we envision greater use of the U.S. Census and other primary and secondary data for needs assessment and identifying new, non-traditional audiences. The planned use of a geographic information system (GIS) for mapping and analysis, such as ArcGIS, will expand the utility of these data.

## 1890 Research

Stakeholder input will be collected throughout the year in informal and formal meetings. The research center advisory councils are critical since they include representatives from different stakeholder groups. Regular meetings of these Councils will be held on the campus where research results will be presented and stakeholders' input will be requested. Input will also be collected from other stakeholders identified through churches, schools, recreation centers, food-banks, and healthcare providers. Additionally and as appropriate, researchers from the university will make presentations at meetings/conferences organized by different stakeholder groups. As appropriate, specific efforts will be made to

coordinate these activities with the extension program in order to avoid duplication of effort and redundancy.

#### **4. How Considered**

In the budget process  
To identify emerging issues  
To set priorities  
In the staff hiring process  
To redirect Extension programs  
To redirect Research programs

### **IV. Critical Issues**

#### **1 Agricultural and Food Systems**

##### **Description:**

Maintain and enhance production systems of all types and scales by improving knowledge and adoption of production efficiencies and effectiveness, new technologies, good agricultural practices, good food safety technologies and practices, and integrated pest management.

Help producers and growers protect the economic sustainability of their operations through agricultural business planning, financial management and succession planning.

Improve Floridians' knowledge about food systems, agricultural production, and the environment through public education.

Expand the energy landscape by teaching farmers and business owners about the availability, viability, applicability, and use of alternative energy sources.

Research (Top KAs): Plant Genome, Genetics, and Genetic Mechanisms; Pathogens and Nematodes Affecting Plants; Integrated Pest Management Systems; Basic Plant Biology; Economics of agricultural production and farm mgmt; Plant Management Systems; Insects, Mites, and Other Arthropods Affecting Plants; Genetic Improvement of Animals; Animal Genome; Domestic Policy Analysis; Animal Physiological Processes; Animal Diseases; Animal Welfare/Well-Being and Protection.

**Term:** Long

##### **Science Emphasis Areas**

Bioeconomy, Bioenergy, and Bioproducts  
Education and Multicultural Alliances  
Sustainable Agricultural Production Systems

#### **2 Water Quality and Conservation**

##### **Description:**

Conserve Florida's finite freshwater resources by teaching rural, suburban and urban audiences how to use less water.

Improve the quality of Florida's water resources by teaching target audiences how to implement agricultural Best Management Practices, Green Industries Best Management Practices, Florida-Friendly Landscaping principles, and low-impact development standards.

Improve Floridians' knowledge about water allocation, use, quality, and conservation through public education.

Research (KAs): Watershed protection and management; Conservation and efficient use of water.

**Term:** Long

### **Science Emphasis Areas**

Education and Multicultural Alliances  
Environmental Systems  
Sustainable Agricultural Production Systems

## **3 Natural Resources and Environment**

### **Description:**

Improve community decision-making relative to natural coastal resources and policies by providing scientific and economic information on the consequences of various options.

Develop and sustain natural resource entrepreneur opportunities by teaching clientele how to start and maintain businesses with focus on natural resources-related jobs.

Improve environmental quality by teaching citizens about the relevance and value of natural resources to Florida's economy.

Research (Top KAs): Soil, plant, water, nutrient relationships; Aquatic and terrestrial wildlife; Conservation of biological diversity; Pollution prevention and mitigation; Natural resource and environmental economics; Protect soil from harmful effects of natural elements; Weather and climate; Management and sustainability of forest resources; Appraisal of soil resources; Outdoor recreation.

**Term:** Long

### **Science Emphasis Areas**

Agroclimate Science  
Education and Multicultural Alliances  
Environmental Systems

## **4 Nutrition, Health and Food Safety**

### **Description:**

Empowering Floridians to build healthy lives and achieve social and economic success through health and wellness, nutrition, and food systems.

Improve Floridians' food choices by providing education and intervention for consumers, families, and youth.

Empower individuals to make positive lifestyle choices that improve physical health.

Improve Floridians' ability to handle food safely by providing education and intervention for consumers, families, and food handlers

Maintain and enhance production systems of all types and scales by improving knowledge and adoption of food safety.

Research (Top KAs): Insects and other pests affecting humans; Protect food from contamination by pathogenic microorganisms, parasites and naturally occurring toxin; New and improved food products; Zoonotic diseases and parasites affecting humans; Quality maintenance in storing and marketing food products; Nutrient composition of food; Requirements and function of nutrients and other food components; Healthy lifestyle; Hazards to human health and safety.

**Term:** Long

### **Science Emphasis Areas**

Education and Multicultural Alliances  
Food Safety  
Human Nutrition



## **5 Families and Communities**

### **Description:**

Improve Floridians' access to affordable housing (purchase and finance) and teach owners and renters how to operate and maintain their homes.

Improve individual and family financial stability by teaching Floridians about knowledge and behavior aspects of money management and energy efficiency and conservation.

Improve the lifestyle of older Floridians by educating individuals, families, and communities about aging-related issues.

Empower individuals to make positive lifestyle choices that improve mental health, strengthen relationships, and improve parenting and child care.

Improve economic vitality of Florida's communities by engaging community members in assessments, strategic planning, and business/entrepreneurial support.

Strengthen communities by helping engage citizens and build capacity by facilitating communication, leadership development, and problem solving as related to community issues and social concerns.

Improve community resiliency by facilitating responsible decision-making and policy establishment.

Strengthening urban and rural community resources through economic development and entrepreneurship, community capacity building, public policy education, and improved community energy policy and management decision-making.

Educate and assist communities in disaster and emergency preparedness, mitigation, response and recovery.

Research (Top KAs): Consumer economics; Community institutions, health and social services; Human development and family well-being; Individual and family resource management; Community resource planning and development.

**Term:** Long

### **Science Emphasis Areas**

Education and Multicultural Alliances

Family & Consumer Sciences

## **6 Youth**

### **Description:**

Engage youth in experiential learning using Extension's community-based 4-H Youth Development program to complement formal education that will lead to an interest in learning, development of important life skills, and workforce readiness.

Foster learning environments to make positive 4-H Youth Development possible by educating caring adults about volunteerism and using adult-youth partnerships.

Research (KA): Youth development

**Term:** Long

### **Science Emphasis Areas**

Education and Multicultural Alliances

Youth Development

## **7 Research for Management of Invasive Pest Species**

### **Description:**

Improving Offshore Mitigation Strategies for Invasive Pests Coming from the Caribbean and Central America

Biological Control and Sustainable Management of the Invasive Aquatic Weeds in North Florida Springs to

minimize their Negative Impacts on Climate change and water quality  
Integrated pest management of pests on fruit and vegetable crops in North Florida  
Strategies for the identification, prevention or management of invasive pest species  
Improve Floridan's knowledge of integrated pest management approaches to be adopted by farmer's to increase profitability  
Research (KAs): Insects, Mites, and other arthropods affecting plants; Plant biological Efficiency and abiotic stresses affecting plants; Weeds affecting plants, Biological control of pests affecting plants; Integrated pest management systems

**Term:** Long

**Science Emphasis Areas**

Agroclimate Science  
Environmental Systems  
Food Safety  
Sustainable Agricultural Production Systems