

UF/IFAS Legislative Priorities 2022

UF/IFAS Workload \$3,615,000 Recurring

- Provide for increased research and Extension workload demands. This funding is requested to increase UF/IFAS capacity and will allow for hiring a combination of faculty and staff to provide support for both rural and urban needs in different locations.

Quantifying Ecosystems Services with Artificial Intelligence \$2,017,876 Recurring

- The program will develop an artificial intelligence (AI) tool through the formation of a statewide ecosystem services (ES) monitoring network to quantify, validate, and develop ecosystem services delivered by agricultural and natural systems in Florida. The AI tool and monitoring network will provide guidance to policy makers, decision-support tools to agricultural producers and land managers, and opportunities to market “climate-smart” products. An ES monitoring system will also allow the quantification of services that are provided by unmanaged lands encompassed in the Florida Wildlife Corridor.

Nutrient Application Research \$2,263,753 Recurring

- This research project will provide modernized, science-based fertilizer (nutrient) application rates ensuring farmers can protect the environment while growing food for the nation. This research project will assess, update, and validate the recommended amount of fertilizer that should be applied to two of Florida's largest vegetable crops and citrus with the intention of expanding to additional crops as needed in the future. Simultaneously, UF/IFAS will continue developing an artificial intelligence database on nutrient recommendations that will be developed through students in agriculture and engineering disciplines working with local farmers.

UF/IFAS Workload **\$3,615,000 Recurring**

Submitted by State University System Board of Governors (BOG)

This funding request is for an increase in the UF/IFAS Workload. Funding for our Workload **increases capacity for researchers to provide solutions to problems and challenges faced by the agricultural and natural resources industries as well as our communities.**

UF/IFAS extension agents educate the industries, producers and communities on new technologies and production practices. **UF students benefit from learning about and helping with the latest research statewide.**

The Workload Formula determines **the cost of increased workload based on the increased demand for research and extension with the increasing Florida population.**

It was developed at the request of and approved by the Florida Board of Governors (BOG) in 2004. The Workload Formula uses extension delivery methods to measure increases in workload by both extension and research faculty in the form of research delivery units. The model uses non-traditional teaching methods such as field consultations, office consultations, telephone and email requests, group workshops, and printed materials as well as patents and licenses.

Research Delivery Method ¹	2018-2020 ²	Weight ³	Research Delivery Units ⁴
Patents and Licenses	167	15.00	63
Research Materials	1,674	10.00	418
Educational Materials	26,301	4.00	2,630
Field Consultations	53,930	3.00	4,045
Office Consultations	101,251	1.50	3,797
Group Learning Events	1,737,008	1.00	43,425
Electronic Consultations	984,474	0.25	6,153
Social Media Engagement	21,715,991	0.01	5,429
Web Visits	8,941,280	0.01	2,235
Total	33,562,078		68,195
2019-20 State Expenditures for Research and Extension			\$ 131,512,788
Expenditures per Weighted RDU ⁵			1,928
RDU Increase (2.75%) ⁶			1,875
RDU Funding Request ⁷			\$ 3,615,000

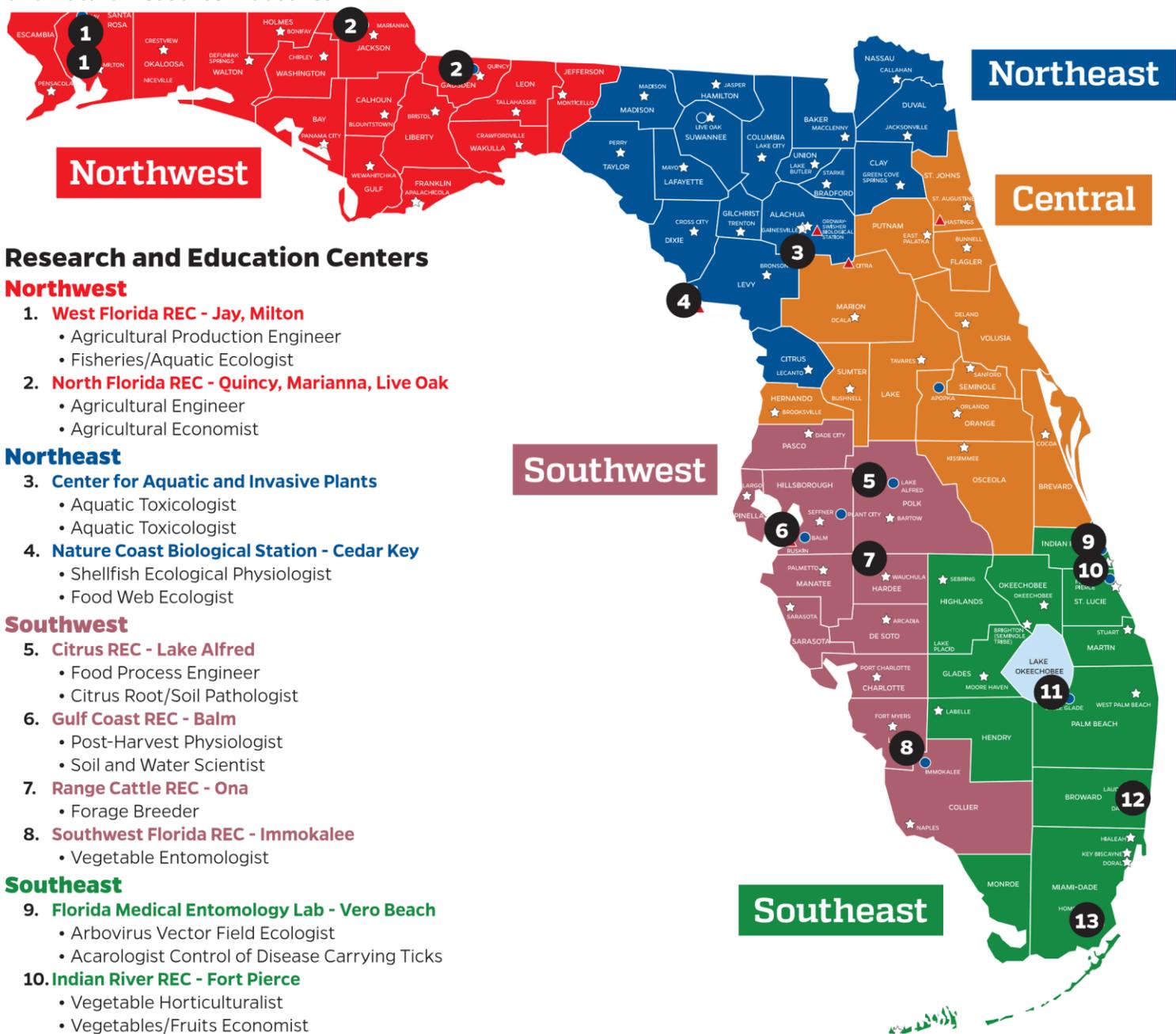
UF has ranked first or second among US universities in total agricultural sciences research expenditures since fiscal year 2001. UF/IFAS has a \$610 million economic contribution to the state supplying 8,862 jobs. Presence of the University of Florida, with UF/IFAS Extension offices in all 67 counties and 17 off campus research centers/sites maintaining 4.2 M gross square feet in 1,309 buildings, 54,092 acres of land.

Return on investment:

- More than **200 graduate students** are working on their research projects at the UF/IFAS Research and Education Centers around the state
- Providing **38 online undergraduate and master's degrees, undergraduate certificates**, and graduate certificates not available anywhere else in the state.
- Workforce training through UF/IFAS Extension – **increasing income by as much as 23% percent**
- In 2020, Family Nutrition Program **taught 13,767 classes reaching more than 85,936 people in 40 counties** by influencing shopping & eating behaviors, increasing food access & improving local communities health
- From 2015-2020, **894 cultivar licenses were granted with 255 crop varieties released**- 67% obtained by Florida based growers, 95% of commercial strawberries and 85 % blueberries in Florida are UF/IFAS varieties.
- Since 2014 UF/IFAS Extension efforts **saved over 2.78 billion gallons of water in Florida** using various science-based strategies.
- In 2020 despite COVID19 pandemic, **UF/IFAS faculty published 2,150 publications in highly regarded peer-reviewed journals**, 18% higher than 2019 and is a tremendous reflection of our research faculty productivity and scientific impact.
- In 2020, **9,530,075 visits to UF/IFAS Publications, Blogs & Websites** educating citizens of Florida & the U.S.

The University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) is a proud part in the nation's land-grant university system, which was created in 1862 to provide access to higher education for people of average means. As part of its land-grant mission, UF/IFAS operates numerous locations throughout Florida, including 14 academic departments and two schools based at the UF main campus in Gainesville, 17 off-campus research centers and sites and UF/IFAS Extension offices in every county.

The list details positions identified as critical needs to address the states demand and challenges for agricultural and natural resource industries.



Research and Education Centers

Northwest

1. **West Florida REC - Jay, Milton**
 - Agricultural Production Engineer
 - Fisheries/Aquatic Ecologist
2. **North Florida REC - Quincy, Marianna, Live Oak**
 - Agricultural Engineer
 - Agricultural Economist

Northeast

3. **Center for Aquatic and Invasive Plants**
 - Aquatic Toxicologist
 - Aquatic Toxicologist
4. **Nature Coast Biological Station - Cedar Key**
 - Shellfish Ecological Physiologist
 - Food Web Ecologist

Southwest

5. **Citrus REC - Lake Alfred**
 - Food Process Engineer
 - Citrus Root/Soil Pathologist
6. **Gulf Coast REC - Balm**
 - Post-Harvest Physiologist
 - Soil and Water Scientist
7. **Range Cattle REC - Ona**
 - Forage Breeder
8. **Southwest Florida REC - Immokalee**
 - Vegetable Entomologist

Southeast

9. **Florida Medical Entomology Lab - Vero Beach**
 - Arbovirus Vector Field Ecologist
 - Acarologist Control of Disease Carrying Ticks
10. **Indian River REC - Fort Pierce**
 - Vegetable Horticulturalist
 - Vegetables/Fruits Economist
11. **Everglades REC - Belle Glade**
 - Soils System Chemist
 - Digital Agriculture Scientist
12. **Fort Lauderdale REC - Davie**
 - Turf-Ornamental Entomologist
 - Turf-Ornamental Pathologist/Virologist
13. **Tropical REC - Homestead**
 - Ornamental/Vegetable Horticulturist
 - Fisheries Biologist/Ecologist

Legend

- Research and Education Centers
- UF/IFAS CALS Academic Locations @ REC
- ▲ Research and Demonstration Sites
- ☆ County Extension Offices
- ★ UF Main Campus

Florida is poised to lead the ecosystem effort by developing the model of an ecosystem services (ES) monitoring network to be used for a national ES monitoring system. Balancing agriculture production with natural resources, environmental and societal needs will lead to transformational improvements and resilience in U.S. agricultural.

UF/IFAS, UF's Herbert Wertheim College of Engineering, and UF's College of Design, Construction and Planning will collaborate and **develop an artificial intelligence (AI) tool to identify, validate, and quantify ecosystem services delivered by agricultural and natural systems in Florida.**

Ecosystem services (ES) are benefits delivered by land and water from agricultural and natural systems. Agricultural producers provide more than food, fuel, and fiber. They also provide carbon sequestration, water storage, pollinator support, and other essential services needed to address the climate crisis.

Some of the benefits include:

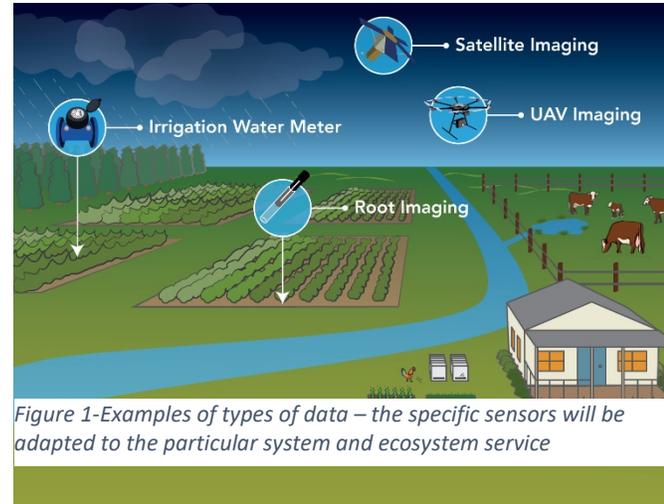
- the preservation of Florida wildlife and imperiled plant species
- providing increased groundwater recharge and stream flows
- maintaining connections between systems for delivery of water quantity and quality
- remove carbon dioxide from air and sequester it in the soil
- minimize harmful algal blooms and other ecosystem disturbances
- maintaining the productivity of agricultural and livestock systems

The AI tool will provide guidance to policy makers and natural resources managers, decision-support tools to agricultural producers and land managers, as well as opportunities to market "climate-smart" products.

Through a partnership with the UF/IFAS Center for Stress Resilient Agriculture and the UF Center for Landscape Conservation & Planning, the statewide ES monitoring network will encompass managed and unmanaged land and **identify the most important wildlife corridors across the state of Florida.** The Florida Wildlife Corridor connects unmanaged lands that help protect Florida's watersheds, wildlife, and coastal and ecological systems while sustaining agricultural production.

Students will be a key partner in the formation of this ES monitoring network. This process will train diverse teams of students composed of plant-based disciplines (agronomy, plant pathology, horticulture, and soil science), machine learning/artificial intelligence engineering disciplines, and landscape ecology disciplines. Students' involvement in the building of the ES network will enable them to develop hands-on skills in applied AI along with direct mentorship from industry stakeholders.

The team working with Solutions for the Land, Florida Climate Smart Agriculture, Florida Conservation Group, UF/IFAS Extension and other partners will provide education state/nationwide on the importance of productivity and protection of ranchlands, timberlands, and the Florida Wildlife Corridor.



These funds will provide for year 2 of a 5-year research project. This project will **provide modernized, science-based fertilizer (nutrient) application rates ensuring farmers can protect the environment while growing food for the nation.** It is critical that the amount of fertilizer applied is accurate, as too much affects the environment while too little reduces the yield and could threaten the viability of a farm.

This research project will assess, update, and validate the recommended amount of fertilizer that should be applied to crops. Currently, two of Florida's largest vegetable crops, (potatoes and tomatoes) are involved in this research. In this second year, the project will expand to include citrus.

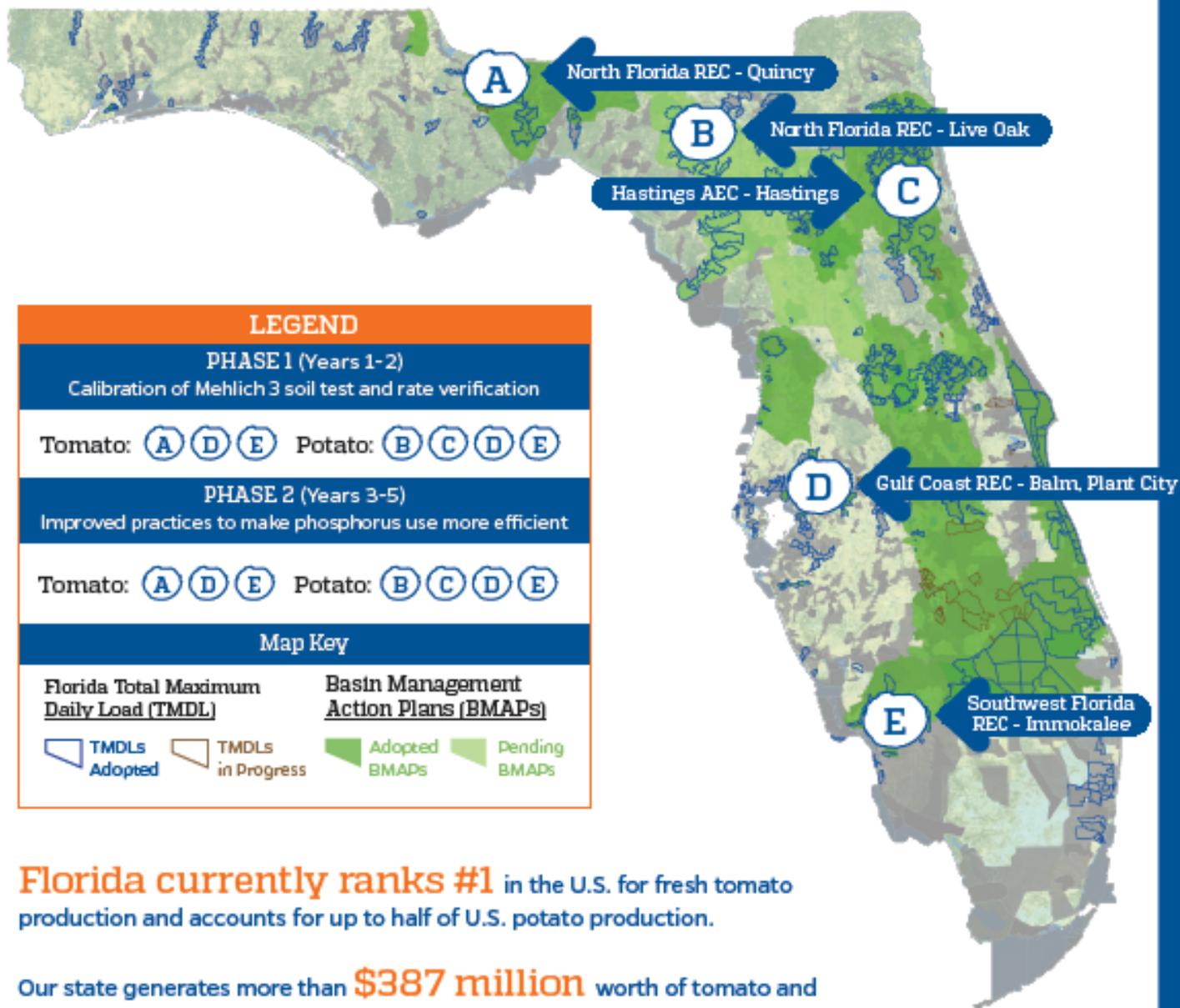
In the face of a disease (HLB or citrus greening) that is decimating the citrus industry, it is critical that fertilizer recommendations for citrus also be evaluated and updated. This project will serve as a model to improve recommendations for other annual and perennial specialty crops (e.g., carrots, cabbage, and avocados) and agronomic crops (e.g., corn, cotton).

These rates of application will also assist agricultural producers with compliance of the 2020 Clean Waterways Act and 2016 Florida Springs and Aquifer Act.

The project will continue data collection for development of an artificial intelligence (AI) database for updated nutrient recommendations for current and future crops. UF is home to the fastest university-owned AI supercomputer in the U.S. Using the supercomputer, this UF/IFAS project incorporates the data from an established network of data sources (compilation of all available public data sources (e.g., FDACS, WMDs, NRCS)) for ecosystem services developed for improved nutrient management.

Teams of students in agricultural and engineering disciplines are integrated into each of the regional research teams and work with local growers to establish experiments on farms. Students will gain hands-on experience working with AI tools as they collect necessary crop nutrient data, explore ways to improve data flow, and interact across different data sources. The amount of data sources and data input into the AI database ultimately will provide farmers with proper guidance about water management, crop rotation, timely harvesting, type of crop to be grown, optimum planting, pest attacks, nutrition management, and more.

More accurate nutrient rates will enable agricultural producers to apply fertilizer to their crops with precision and accuracy. Farmers' shift to precision cultivation for higher crop yield using fewer resources creates more efficient food production. It also reduces impacts on Florida's environment. Success will be measured by the reduced nutrient runoff from agricultural operations. Precise nutrient application can help decrease harmful algal blooms and maintain economic sustainability in the face of environmental changes in temperature and precipitation.



Florida currently ranks #1 in the U.S. for fresh tomato production and accounts for up to half of U.S. potato production.

Our state generates more than **\$387 million** worth of tomato and potato crops.