Public Investment in UF/IFAS Yields Significant
ECONOMIC BENEFITS AND JOBS

UF|IFAS
UNIVERSITY of FLORIDA

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UF/IFAS Research and Extension for Agriculture and Natural Resources

$20 IN BENEFITS FOR EVERY $1 INVESTED

Investments in UF/IFAS research and Extension programs continue to show significant returns that create jobs and improve Florida's economic vitality. 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's a return of $20 in benefits from increased agricultural productivity.**[1] Agricultural research helps farmers produce more food, fiber and fuel with the same amount of land and inputs; for the rest of us, agricultural research pays off with lower food prices, increased food safety and improved environmental stewardship.[2]

The State of Florida invests approximately $160 million annually in UF/IFAS agricultural research and development, as well as Extension.[3] In return, this investment contributes about $3.2 billion in economic benefits to the state, based on the 20:1 benefit-cost ratio.

Health

IMPROVING QUALITY OF LIFE

Because the University of Florida is home to a top-flight medical college, casual observers might be surprised at the number of health-related research and Extension projects taking place within the UF Institute of Food and Agricultural Sciences. **Examples include researchers who have established strong programs in diet and nutrition, as well as mosquito-borne diseases; Extension faculty develop and conduct programming to help residents improve their overall health or deal with specific issues.**

Lupus is a mysterious condition that causes the human immune system to attack the body's own tissues, resulting in chronic pain and inflammation; in extreme cases lupus can be life-threatening. A team with the UF/IFAS Department of Microbiology and Cell Science is investigating a compound that may be useful in treating this malady; it silences compounds that would ordinarily signal cells to begin producing antibodies.

The 4-H Health Rocks! program is succeeding in its mission to steer youth away from drugs and alcohol, according to a recent UF/IFAS study. Almost 1,000 children ages 10 to 15 in several Florida counties participated in Health Rocks! sessions and activities for a minimum of 10 hours, and later completed surveys on their knowledge and attitudes about substance use. The results showed that, after participating in the program, the children felt better able to resist peer pressure to try tobacco, alcohol and drugs.

Oil pressed from the seeds of Florida's native muscadine grape might contain an important obesity-fighting compound, according to a UF/IFAS food science and human nutrition researcher. The oil contains an unsaturated form of vitamin E that may discourage formation of new fat cells within the human body. Many muscadine grape producers and wineries discard seeds when they process grapes, meaning there may be a ready supply of raw materials for pressing muscadine oil.

Health-conscious Floridians can learn how to make lifestyle changes to decrease their cancer risk with a new online program developed by a UF/IFAS nutrition and health specialist. Known as TAKE CONTROL to Reduce Your Cancer Risk, the program was launched in April; it includes nine modules that can be completed on the user's schedule.

Mobile Device Apps

HARNESSING NEW TECHNOLOGY

Today, it's common for Florida residents and visitors to rely on smartphones for their basic communication and information needs, and the same goes for the state's agricultural and natural resources producers. **To promote economic growth and environmental stewardship, UF/IFAS personnel have designed numerous mobile-device apps that can help users conserve resources, beautify their yards or run their operations more profitably.**

A team of experts from UF, the University of Georgia and the USDA is developing a suite of "smart irrigation" apps focused on specific Southeastern crops. The series is available at **http://smartirrigationapps.org**. Current apps address citrus, strawberry, cotton and avocado; new apps for tomato, squash and other crops are in development.

Citrus growers are the intended audience for a new insecticide-selection app designed for Android smartphones. By entering data on the type of crop, insect pressure, harvest date and previous spray history, the app will recommend a specific product; growers are currently testing the app prior to its official release.

The Florida Automated Weather Network, or FAWN, has been providing site-specific data to Florida farmers since 1997 via its website. Now, the program is testing a mobile app with the help of growers, My Florida Farm Weather. Visit **http://fawn.ifas.ufl.edu** for more information.

Naturally EscaRosa, a campaign promoting ecotourism and agritourism in Escambia and Santa Rosa counties, offers an app to inform visitors about the area's many appealing destinations. The app is available for free download at major app stores and a counterpart website is at **http://escambia.ifas.ufl.edu/naturally-escarosa/index.php**.

Gardeners wondering which plant varieties will thrive in their yards can use the Florida-Friendly Landscaping™ Plant Guide to obtain recommendations, based on the user's location and plant temperature tolerance and watering requirements. The app costs $1.99 and is available at **http://ffl.ifas.ufl.edu/plants**.

Sales Revenues from Florida's Agriculture, Natural Resources and Food Industries, 2013

$148.54	2.2	$56.29	$12.51
BILLION DIRECT OUTPUT OR SALES REVENUES	MILLION JOBS	BILLION IN EXPORTS	BILLION IN BUSINESS-TAX IMPACTS PAID TO LOCAL, STATE AND FEDERAL GOVERNMENTS

Florida's Agriculture, Natural Resources and Food Industries

$148.54 BILLION IN DIRECT OUTPUT, 2.2 MILLION JOBS

In calendar year 2013, Florida's agriculture, natural resources and food industries supported 2.2 million jobs in the state, generated $148.54 billion in direct output (sales revenues) and contributed $12.51 billion in business taxes to local, state and federal governments.[4] These industries span the market chain, including commodity production, supporting services and food distribution to consumers.

Due to Florida's subtropical climate, its focus on specialty crops and its access to international ports, exports from Florida to domestic and international markets accounted for $56.29 billion in revenues. **As globalization continues to increase — it is expected to double by 2050[5] — the influx of invasive pests and diseases will put greater demands on UF/IFAS research and Extension to maintain gains in agricultural productivity and develop new technologies to increase competitiveness.**

Citrus

BATTLING CITRUS GREENING DISEASE

The bacterial disease citrus greening continues to wreak havoc on Florida growers, but research investments are leading to potential successes on numerous fronts. The situation is critical because most infected trees eventually die; from the 2006-07 growing season through 2012-13, greening has cost the industry an estimated $7.8 billion in lost revenues, according to a UF/IFAS estimate.[6]

Using a gene from the model plant *Arabidopsis thaliana*, scientists at the UF/IFAS Citrus Research and Education Center in Lake Alfred have created transgenic citrus trees with enhanced greening resistance. The study used Hamlin and Valencia oranges modified with an *Arabidopsis* gene believed to enhance overall disease resistance. Three of the resulting transgenic tree lines remained healthy during a 3-year study under heavy infection pressure.

The insecticide imidacloprid helps defend Florida citrus groves from the Asian citrus psyllid, an invasive insect that transmits the citrus greening pathogen. **Research by a UF/IFAS citrus entomologist indicates that the insecticide's efficiency could be enhanced up to 200-fold by packaging it in microscopic polymer beads that can penetrate tiny openings in leaf and bark surfaces.**

Because Asian citrus psyllids acquire the greening pathogen from infected trees and unwittingly spread it to healthy ones, growers need to diagnose the disease as early as possible, enabling them to remove greening-infected trees and discourage outbreaks. **An inexpensive, easy-to-use sensor developed at the UF/IFAS Department of Agricultural and Biological Engineering may offer a solution; it works by analyzing light reflected from citrus leaves.**

Water

PROTECTING AN ESSENTIAL RESOURCE

Abundant clean water is essential to Florida's two biggest industries, tourism and agricultural and natural resources production, so UF/IFAS scientists have made water conservation and quality their top priorities. Protecting water resources is a complex task, requiring teamwork, creative thinking and multidisciplinary approaches, as well as participation by producers and residents.

A 20-year effort has dramatically reduced phosphorus levels in water exiting the Everglades Agricultural Area, a 470,000-acre farming area south of Lake Okeechobee. According to the latest assessment, phosphorus levels averaged 94 parts per billion in 2015, about one-fifth the amount present in 1986, when a state-mandated plan took effect. The plan requires area farmers to follow Best Management Practices for crop production to protect the Everglades from excessive nutrient loads in water coming from EAA. The effort involves growers, UF/IFAS researchers and Extension personnel, and state and federal agencies.

Copper-based sprays are a mainstay in protecting Florida's citrus crop from fungal diseases, but over time, copper can accumulate in soils, compromising water quality. **Researchers at the UF/IFAS Indian River Research and Education Center show that growers can address the problem inexpensively by treating grove soils with a solution containing calcium residue from local water-treatment plants.** The treatment chemically stabilizes copper in forms that are not water-soluble.

Early results suggest that UF/IFAS researchers have succeeded with an automated system they helped design, enabling nursery operations to irrigate container-grown plants more efficiently. A study at one North Florida nursery showed that the system reduced water consumption by 21 percent, without affecting plant growth or quality.

Florida Citrus Facts

31
FLORIDA COUNTIES INVOLVED IN COMMERCIAL CITRUS PRODUCTION

525,000
2012-13 FLORIDA CITRUS ACREAGE

156
MILLION BOXES OF CITRUS FRUIT HARVESTED IN 2012-13

ABOUT **10%**
OF FLORIDA CITRUS IS SOLD FRESH, THE REST IS PROCESSED FOR JUICE

Florida Water Facts

FLORIDA CONTAINS MORE THAN
7,700
FRESHWATER LAKES

EACH DAY, THE AVERAGE FLORIDIAN USES
124
GALLONS OF WATER

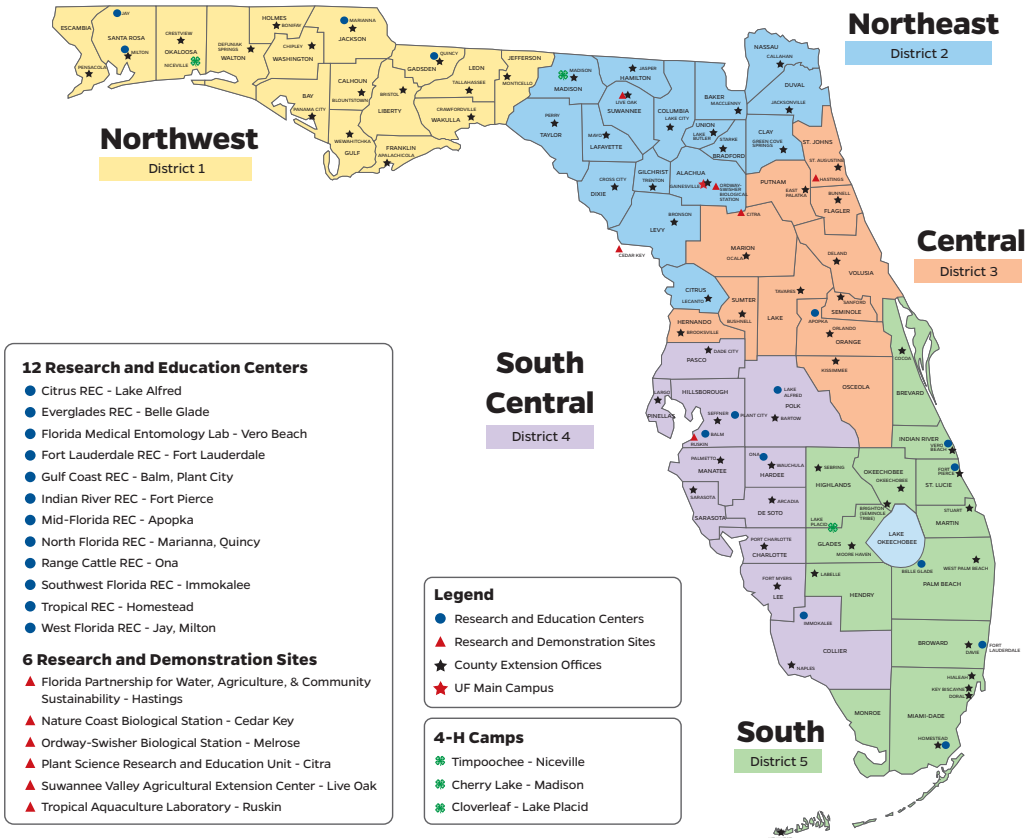
ABOUT **85%**
OF FLORIDA'S WATER SUPPLY COMES FROM SUBTERRANEAN AQUIFERS

OUTDOOR WATER USE ACCOUNTS FOR
ABOUT **1/2**
OF FLORIDA'S RESIDENTIAL WATER CONSUMPTION

The Land-Grant Higher Education System

The University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) is a proud part of the nation's land-grant university system. This system of public higher education institutions was established by the U.S. Congress through the Morrill Acts of 1862 and 1890 to provide educational opportunities to citizens of average means; UF and Florida A&M University are Florida's two land-grant institutions. Additional federal legislation funded two other initiatives that expanded the land-grant mission with research and outreach efforts. At UF/IFAS, the College of Agricultural and Life Sciences educates students, the Florida Agricultural Experiment Station conducts research and the Florida Cooperative Extension Service offers outreach activities to producers and residents. To fulfill its mission, UF/IFAS has 14 academic departments and two schools based at the UF main campus in Gainesville, 18 research facilities throughout the state, and Extension offices in all 67 Florida counties.

UF/IFAS Statewide Facilities



12 Research and Education Centers

- Citrus REC - Lake Alfred
- Everglades REC - Belle Glade
- Florida Medical Entomology Lab - Vero Beach
- Fort Lauderdale REC - Fort Lauderdale
- Gulf Coast REC - Balm, Plant City
- Indian River REC - Fort Pierce
- Mid-Florida REC - Apopka
- North Florida REC - Marianna, Quincy
- Range Cattle REC - Ona
- Southwest Florida REC - Immokalee
- Tropical REC - Homestead
- West Florida REC - Jay, Milton

6 Research and Demonstration Sites

- Florida Partnership for Water, Agriculture, & Community Sustainability - Hastings
- Nature Coast Biological Station - Cedar Key
- Ordway-Swisher Biological Station - Melrose
- Plant Science Research and Education Unit - Citra
- Suwannee Valley Agricultural Extension Center - Live Oak
- Tropical Aquaculture Laboratory - Ruskin

Legend

- Research and Education Centers
- Research and Demonstration Sites
- County Extension Offices
- UF Main Campus

4-H Camps

- Timpoochee - Niceville
- Cherry Lake - Madison
- Cloverleaf - Lake Placid

Learn about UF/IFAS Research Discoveries and the Florida Agricultural Experiment Station at:
http://research.ifas.ufl.edu/featured-3-menus/discoveries/featured-discoveries/

This report, along with state-level and county-level information on UF/IFAS Extension impacts, can be found at:
http://ifas.ufl.edu/economicimpacts.html

Information on the 2016 UF/IFAS Legislative Budget Requests (LBRs) can be found at:
http://ifas.ufl.edu/svp/special-reports/legislative-budget-requests/

Sources Cited

1. 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.
2. Ibid.
3. UF/IFAS Office of Budget and Finance.
4. Hodges, A.W., Rahmani, M., and Stevens, T.J. 2015. Economic Contributions of Agriculture, Natural Resources, and Food Industries in Florida in 2013. University of Florida/IFAS, http://edis.ifas.ufl.edu/fe969.
5. Heisey, P., Wang, S.L., and Fuglie, K. 2011. Public Agricultural Research Spending and Future U.S. Agricultural Productivity Growth: Scenarios for 2010-2050. United States Department of Agriculture Economic Research Service, Economic Brief Number 17. http://www.ers.usda.gov/publications/eb-economic-brief/eb17.aspx
6. Hodges, A.W., Rahmani, M., Stevens, T.J., Spreen, T.A. 2014. Economic Impacts of the Florida Citrus Industry in 2012-13. University of Florida/IFAS, http://www.fred.ifas.ufl.edu/pdf/economic-impact-analysis/Economic_Impacts_Florida_Citrus_Industry_2012-13.pdf.

For more information, contact:

Jack M. Payne
Senior Vice President
Agriculture and Natural Resources
1008 McCarty Hall
P.O. Box 110180
Gainesville, FL 32611-0180
(352) 392-1971
jackpayne@ufl.edu
http://ifas.ufl.edu

Mary Ann Hooks
Director
UF/IFAS Governmental Affairs
215 South Monroe Street
Suite 110
Tallahassee, FL 32301
(850) 681-0000
mgosa@ufl.edu
http://ifas.ufl.edu/svp/ifas-governmental-affairs-/

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