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

With Florida’s population now exceeding 20 million, the state’s water resources are in greater demand than ever before. In response, UF/IFAS has prioritized its efforts to enhance and protect the state’s water quality and availability.

To better coordinate water conservation efforts statewide and reach stakeholder groups more effectively, UF/IFAS Extension has established five new positions known as **water resource regional specialized agents**. Each agent works in a different UF/IFAS Extension district and is assigned to interface with one or more of the state’s five Water Management Districts, to facilitate greater communication and collaboration. The individuals filling the new positions have extensive experience with the scientific and practical aspects of water use and conservation.

A team of UF/IFAS experts has developed a suite of mobile-device applications, or “apps,” that can help homeowners, landscape managers and farmers conserve water without negative impacts on lawns or crops. So far, the team has released six apps under the Smartirrigation name, developed for turf, citrus, vegetables, strawberry, cotton and avocado. Each app notifies users when irrigation is advisable, based on crop variety, geographic location, weather and other factors.

The **avocado app** was recently the subject of extensive field testing, which was undertaken to verify that its predictive power was sufficient. Researchers determined that the app was providing reliable results by averaging data from five days of recent weather observations, and did not require additional days of data.

**Citrus**

Florida’s multi-billion dollar citrus industry has been dramatically impacted by a bacterial disease known as **citrus greening, which reduces yields and eventually kills infected trees**. Today, the disease infects an estimated 80 percent of the state’s commercial citrus trees.

**UF/IFAS response has been extensive. The latest accomplishments include:**

Scientists with UF/IFAS have established that the greening bacterium initially damages the roots of infected trees, impairing their ability to deliver nutrients. Fortuitously, they also determined that growers can minimize root damage by using soil-applied fertilizers and optimizing soil pH. Recommendations resulting from these studies have been disseminated to growers statewide, and anecdotal reports indicate that **yields have increased up to 30 percent** when growers followed recommended practices.

UF/IFAS citrus breeders have released a greening-tolerant rootstock known as ‘UFR-17’, which is **less vulnerable to citrus greening infection than many rootstocks already in use**. Numerous other rootstock varieties are under evaluation for their potential and growers await the results.

Recent studies indicate that a long-term solution to citrus greening may come from a crop improvement technique known as “clustered, regularly interspaced short palindromic repeats,” or CRISPR. The technique is a form of genetic engineering that involves identifying citrus genes that are activated by the citrus greening bacterium to make the tree easier to infect, then **altering those genes so that they make no response**, or even activate immune defenses, in the presence of the bacterium.

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**Economics**

$20 in Benefits for Every $1 Invested

Investments in UF/IFAS Research and Extension programs 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**. Agricultural research pays off with lower food prices, increased food safety and improved environmental stewardship.

The State of Florida invests approximately $160 million annually in UF/IFAS agricultural research and development, as well as Extension outreach education. In return, this investment contributes about **$3.2 billion in economic benefits to the state**, based on the 20:1 benefit-cost ratio.
Florida is home to a greater number of invasive plants, animals and fungi than any other state in the continental U.S., in part due to its climate and extensive international tourism and trade. Some invasive organisms have captured headlines, including the Asian citrus psyllid, a flying insect that transmits the pathogen responsible for citrus greening; the disease-transmitting mosquito species *Aedes aegypti* and *Aedes albopictus*; and the Burmese python, which threatens wildlife throughout the Everglades.

The Florida Invasive Species Partnership, or FISP, is a multi-agency partnership formed to provide a coordinated, statewide effort to address Florida’s invasive species issues. FISP has been steadily growing in prominence since its formation, less than a decade ago. The University of Florida is one of 20 institutions, agencies and organizations that have joined FISP and support its efforts to educate and assist private landowners, land managers responsible for government properties, and members of the public.

UF/IFAS researchers and Extension agents active in FISP have been conducting events including workshops, symposia, and work days devoted to invasive plant removal and exotic pet amnesty days, where residents can drop off unwanted non-native animals. Recent FISP achievements include development of tools to help private landowners find technical assistance to cope with problems, and help growers find cost-share assistance in the form of grants.

Efforts are under way to bring science-based information to UF/IFAS Extension personnel to better acquaint them with invasive species issues in their communities.

Florida’s Agriculture, Natural Resources and Food Industries
$127.34 Billion in Value-Added Impacts, 1.6 Million Direct Jobs

In calendar year 2014, Florida’s agriculture, natural resources and food industries supported 1.6 million jobs directly connected to these industries, generated **$127.34 billion** in value-added impacts to Florida’s Gross State Product and contributed **$12.87 billion** in business taxes to local, state and federal governments. These industries span the market chain from farm to table, including commodity production, supporting services, processing/manufacturing and food distribution to consumers.

Due to Florida’s subtropical climate, its competitive advantage for specialty crops and its access to international ports, exports from Florida to domestic and international markets accounted for **$59.61 billion** in revenues. As globalization continues to increase — global agricultural demand is expected to increase 70 to 100 percent by 2050 — 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 and disseminate new technologies to increase competitiveness.

Natural Resources

Along Florida’s Big Bend coastline, from Wakulla County to Pasco County, UF/IFAS researchers have made remarkable progress toward restoring the health of ancient oyster reefs damaged by salinity fluctuations years ago. Normally, these reefs support the local seafood industry and minimize storm-related coastal erosion. But when large numbers of adult oysters die simultaneously their shells degrade and the oyster reef begins to resemble a sand bar, inhospitable to free-swimming larval oysters that might otherwise settle and grow, reviving the reef.

With financial support from the National Fish and Wildlife Foundation, The Nature Conservancy Florida, the National Oceanographic and Atmospheric Administration, the Florida Sea Grant Program and other entities, a UF/IFAS research team has developed a low-cost strategy to add structures that attract larval oysters to degraded reefs. The scientists demonstrated that lime rock boulders and polyester mesh bags filled with clam shells are effective, inexpensive “building materials” to use. Monitoring showed that after 18 months, reefs restored in this manner had higher densities of live oysters than most restored oyster reefs in other parts of the U.S.

The project, conducted under the auspices of the UF/IFAS Nature Coast Biological Station, has already shown signs of benefitting the larger Big Bend ecosystem because the restored reefs attracted more birds than unrestored control sites – 62 percent more birds overall and up to 500 percent more for certain species, including the bald eagle.
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.