

## ECONOMICS OF AGRICULTURAL PRODUCTION

Agriculture contributes more than \$141 billion annually to Florida's economy. The state's 47,500 farms produce nearly 300 commodities, and the industry employs 2.1 million people. So its economic value cannot be overstated. University of Florida researchers seek to ensure agricultural products feed the world's growing population, are produced sustainably and contribute to Florida's economic well-being.

UF/IFAS' economic research includes a study on the potential of tomato grafting, which could mean higher production costs in the short term, but increased profits in the long run. Research into oil palm tree crop rotation demonstrating how growers might profitably maintain productivity despite disease may have implications for citrus, as greening threatens to cripple Florida's \$10.68 billion citrus industry.

Strawberry growers also need to fight diseases, and now they can use a UF/IFAS-invented Web tool to save more than \$2 million in 10 years' time on fungicides. For ornamental plants, a novel computer application that tracked buyers' eye movements is helping growers identify the product attributes that consumers value most and direct their production and marketing decisions to increase profitability.

Finally, the environmental horticultural sector generates \$16.3 billion in total revenue impacts, a testament to its importance to Florida's economy.

NATURAL  
RESOURCES



HUMAN  
SYSTEMS



AGRICULTURE



## Ongoing Research



### CONSUMER PREFERENCES

The ornamental plant industry seeks to satisfy a diverse and ever-changing demand for plants to improve landscapes. A UF/IFAS research team led by Hayk Khachatryan, an assistant professor of food and resource economics at the Mid-Florida Research and Education Center in Apopka, used an eye-tracking device that records eye movements when consumers view product images. Researchers then analyzed the relationship between visual behavior and product choices. Understanding consumer preferences and the effects of product attributes such as "Fresh From Florida" labeling helps improve marketing practices, which leads to increased demand for ornamental plants. Findings will also help growers reduce production costs by allowing them to focus on improving plant attributes that consumers value most.



### PINE-BASED BIOFUELS

Pine tree resin is rich in terpenes (hydrocarbons) and shows promise as an alternative biofuel source. For more than 100 years, North Americans tapped pines to produce oleoresin, but domestic production disappeared in the past few decades because of high labor costs and international competition. UF/IFAS researchers including Gary Peter, a professor with the School of Forest Resources and Conservation, have developed production practices and genetic improvements that could reinvigorate the domestic industry, providing landowners with a valuable new product. Compared with traditional methods, borehole tapping doubles the yield per hour, produces oleoresin free of contaminants, and avoids pest damage. Terpene compounds can then be readily converted into biofuels that substitute for diesel or jet fuel.



### TREE REPLACEMENT

When growers plant fruit-bearing trees, their future profits hinge on the trees' long-term productivity. If groves become infected with a progressive disease, yet continue to produce marketable fruit, growers have two options – replanting or treating the disease. Kelly Grogan, a UF/IFAS food and resource economics assistant professor, developed a crop-rotation and disease treatment model for Colombian oil palm that can pinpoint the time window when replanting becomes the most cost-effective option within a treatment plan. The model appears to be applicable to greening-infected citrus trees and may prove helpful to Florida's citrus industry.

## Research with Impact



### GRAFTED TOMATOES

UF/IFAS researchers studied the economic feasibility of grafted tomato production, and, among other results, they found grafting increased production costs. But because grafts produced more yield, grafting also generated more revenue, making the technology a better choice than non-grafted tomato production, said Xin Zhao, an associate professor with the UF/IFAS Department of Horticultural Sciences, who led the research. After harvesting tomatoes at the Suwannee Valley Agricultural Extension Center in Live Oak in 2010 and 2011, study results showed that net farm income could increase from \$253 to \$2,458 per acre annually, depending on the rootstock, environmental conditions, price of tomatoes and the cost of seed and grafting. Scientists are now evaluating grafted tomatoes in Florida soil and weather conditions.



### ORNAMENTAL PLANT INDUSTRY

Florida's nursery and greenhouse industries produce plants for residential landscaping and interior decoration and for businesses that cater to millions of visitors. The plants also provide shade, erosion control and soil protection. In spite of freezes in 2010 that reduced revenues by \$472 million, the environmental horticultural sector generated \$16.3 billion in total revenue impacts, according to a study led by Alan Hodges, a UF/IFAS economist. In fact, environmental horticulture is now Florida's largest agricultural commodity group, Hodges said. The Florida Nursery, Growers and Landscape Association used the study to lobby decision-makers statewide for policies helpful to the industry. In addition, UF/IFAS faculty work with the industry to assure the highest quality ornamental plants are produced in profitable and sustainable ways.



### STRAWBERRY PRODUCTION COSTS

UF/IFAS researchers developed a tool that helps Florida's strawberry growers make decisions about fungicide applications. Called the Strawberry Advisory System (SAS), the Web-based tool takes data such as temperature, leaf wetness and past fungicide applications to advise growers on when to spray. In new research on the SAS' economic effectiveness, John VanSickle, a professor with the UF/IFAS Department of Food and Resource Economics, led a team that examined data collected from UF production experiments conducted in 2006-2012. They found the tool can save growers up to \$1.7 million over 10 years in fungicide spraying for anthracnose and \$890,000 for botrytis on an average strawberry farm. Estimated profits for growers utilizing the SAS increased from 33 percent to 50 percent for anthracnose and from 8 percent to 26 percent for botrytis, depending on the strawberry variety.

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