# UF/IFAS RESEARCH DISCOVERIES

UF IFAS Research UNIVERSITY of FLORIDA

NATURAL RESOURCES

HUMAN SYSTEMS

AGRICULTURE

## GLOBAL ENGAGEMENT

Considering Florida's long, diverse history, it's no surprise that the University of Florida's research program in agricultural and natural resources has always included an international component.

For example, several of the state's best-known commodities, including citrus, beef cattle and sugarcane, arrived centuries ago from other parts of the world, and our researchers have worked for decades to optimize their production in Florida. Similarly, many of the Florida Agricultural Experiment Station's first studies focused on determining whether crops from foreign lands could be grown here profitably.

However, prior to the mid-1960s, few UF agricultural research projects took place in other countries; that changed with the founding of the Center for Tropical Agriculture and the Office for International Programs in Agriculture, which began by addressing food security issues with UF/IFAS expertise.

Today, the world is more interconnected than ever before. Research projects organized by UF/IFAS Global and individual scientists seek to identify promising crop varieties, access new markets for Florida products, understand pests and pathogens that may one day reach our shores, and engage scholars from other nations to promote economic and political stability abroad.

## Ongoing Research

### REDUCING METHANE PRODUCTION

Many ranchers give their cattle commercial feed additives to curtail methane gas production during the digestive process. Methane gas represents a loss of energy that could otherwise support faster growth, and, as a greenhouse gas, methane contributes to global warming. Supplementing feed with certain plants may also reduce methane production, says Adegbola Adesogan, a professor with the UF/IFAS Department of Animal Sciences. Adesogan is working with a visiting Fulbright Scholar from Nigeria to test more than 500 tropical plant species to determine their potential for this purpose. Several plants show great promise, performing better than commercial additives. The study results may enable ranchers to save money and reduce their environmental footprint.

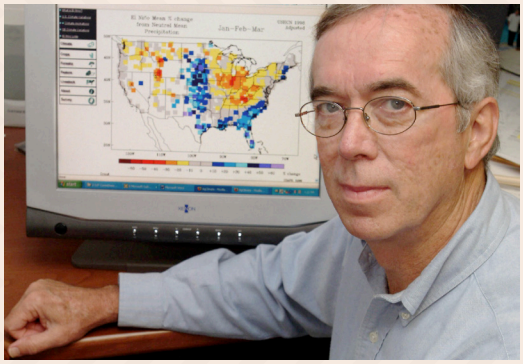
### HEAT-TOLERANT RICE

Rice is one of Tanzania's most important crops, but farmers in this African nation need heat-tolerant varieties to meet demand, particularly if annual temperatures continue to rise in the future. Newton Kilasi, a faculty member with Sokoine University of Agriculture in Morogoro, Tanzania, is researching the issue as part of his doctoral program in the UF/IFAS Department of Horticultural Sciences. Under the guidance of his primary faculty advisor, Bala Rathinasabapathi, a professor with the department, Kilasi is analyzing genes from a heat-tolerant rice variety grown in the Philippines. If he can determine which genes control the trait, researchers may one day transfer heat-tolerance genes to high-yield rice varieties grown in Tanzania. The research may also guide efforts to improve heat tolerance in other crops.

### DECOY SPIDERS

Spiders are known for constructing intricate webs, but a Peruvian orb weaver goes a step further, decorating its home with spider-shaped sculptures made from bits of debris. Lary Reeves, a doctoral student with the UF/IFAS Department of Entomology and Nematology, researches the species with his major advisor, Akito Kawahara, an assistant professor with the Florida Museum of Natural History, and other experts. The sculptures are much larger than the spiders that build them — possibly to ward off flying insects that prey on small spiders. The team is testing this hypothesis through a series of experiments that may also help explain why other spider species create unusual structures in their webs, such as highly visible patterns made from silk.

# Research with Impact



## AGRICULTURAL MODELING

Forty years ago, Jim Jones was one of the few university professors developing computer models for agricultural production. Today, modeling is widely used to predict weather impacts on crops, assess input needs and forecast yields. Jones, an emeritus distinguished professor with the UF/IFAS Department of Agricultural and Biological Engineering, is a co-principal investigator in the Agricultural Model Intercomparison and Improvement Project, or AgMIP. This global effort compares results from different models, focusing primarily on climate variability and climate change, and evaluates management strategies to ensure production of the world's major staple crops. AgMIP has influenced agricultural policy decisions in Southeast Asia and Sub-Saharan Africa, and changed how agricultural scientists collaborate across disciplines.

## MANGO POSTHARVEST HANDLING

Dramatic increases in U.S. mango sales are partly the result of UF/IFAS research, says Jeff Brecht, a professor with the Department of Horticultural Sciences. In 2007, the National Mango Board funded a UF-led multi-institution study on postharvest handling of mangoes bound for U.S. markets from Mexico, Brazil, Ecuador and Peru. Brecht and his colleagues evaluated various methods used for harvesting, cooling, sanitizing, packing, shipping and other handling practices, determining which methods were best for protecting fruit quality and reducing losses. The team then developed a best-practices manual in English, Spanish and Portuguese that's used industrywide. The mango board reports that domestic mango sales have climbed 300 to 400 percent since the manual was published in 2010.

## PEANUT PRODUCTION

Peanuts are a staple crop in Guyana's Rupununi region, but in the 1990s, drought and lack of modern agronomic practices kept yields low. In 2007, Greg MacDonald, a professor with the UF/IFAS Department of Agronomy, developed a multi-institution research project in Guyana to evaluate peanut varieties and methods for weed, disease and insect management. The coalition then developed recommendations that increased the region's peanut production from 300,000 pounds to 1 million pounds in one year. In addition, the researchers helped growers implement the use of farm machinery, proper harvesting, and storage technologies to increase yields further. Consequently, the group partnered with local governments to initiate school feeding programs for more than 4,000 students and launch a marketing program for locally produced peanut butter.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