Water-saving technology focus of new grant

December 4 2009, by Stephanie Schupska

(PhysOrg.com) -- Many ornamental nursery growers test to see if their plants need water by sticking a finger in the soil to see if it's dry. Or, they just water them whether they need it or not. University of Georgia horticulturists have found a better way, one that requires less water, less fertilizer, less money and fewer dirty fingers.

Now they have the funds and collaborations to study more water-saving technologies. UGA is part of a national team that received a five-year $5 million U.S. Department of Agriculture National Institute of Food and Agriculture Specialty Crop Research Initiative Grant. The goal is to save water, increase efficiency and reduce the environmental impacts of ornamental plant production.

To do that, they're developing "the next generation of tools to precisely monitor plant water use, allow for better control of irrigation water applications, and increase the efficiency of water and nutrient use by ornamental growers," said UGA horticulturist Marc van Iersel.

UGA College of Agricultural and Environmental Sciences faculty will use $520,000 of the grant to study affordable soil moisture sensors that can be used easily in greenhouses and nurseries.

Van Iersel has been working with sensors for six years. He's shown that they work in his greenhouse and at test nurseries. And now he can make them feasible for growers.

He, along with UGA professors John Ruter, Matthew Chappell and Paul

Thomas, will work in their greenhouses, nurseries and at test sites at Evergreen Nursery in Statham, Ga., and McCorkle Nurseries in Dearing, Ga.

McCorkle saw the impact of using soil moisture sensors in a study UGA did last year.

“They were watering the plants using normal practices, and we were using soil moisture sensors to irrigate the plants,” van Iersel said. “We reduced water use by 83 percent.

“There’s definitely the potential for drastic water savings. How much probably depends on a particular greenhouse or nursery, but throughout the U.S., it has the potential to save huge amounts of water,” he said.

UGA faculty will also study the water needs of different plants, such as petunia, poinsettia, hibiscus and hydrangea. Cooperators from other institutions will then develop software that will predict how much water these plants use.

Growers will be able to enter information like plant type and age, greenhouse light levels and temperatures to tailor the software. They will be able to estimate how much water they will need for their plants.

“Hydrangeas will definitely be one of the plants,” van Iersel said, “because that is such an important crop, and it’s a plant that seems to need a lot of water. Growers have trouble keeping hydrangeas well-watered, and they’re often over-watered.”

John Lea-Cox from the University of Maryland is leading the overall project, which includes engineers, plant scientists, economists and Extension specialists.

In addition to determining water needs, they will construct watering systems that greenhouse managers can use, understand and install themselves. By combining their expertise, this group aims to develop a commercially-available, affordable product within the next five years.

Other universities and research centers on the grant are Carnegie Mellon Robotics Institute, Colorado State University, Cornell University and the UM Center for Environmental Science. Commercial partners are Decagon Devices in Pullman, Wash., and Antir Software in Jarrettsville, Md. The grant will be combined with an additional $5.2 million in matching funding from various sources.

Economists will look at whether the system is effective and economical for growers, van Iersel said. The questions they hope to answer are “how much water, fertilizer and labor are saved, is there less runoff, less water to treat? And how about labor savings?”

Van Iersel sees the project as more than just a way for the plant industry to save money by reducing water and fertilizer. It can be a way to decrease their environmental impact. And that would benefit society at large, he said.

“If we reduce water use in these greenhouses and nurseries by X number of gallons per year, what is that value to society?” van Iersel said. “If we can reduce runoff from greenhouses and nurseries, how much money is society saving by not having to clean up that water?”

For more details of the project goals, the university teams and the commercial partners, see www.smart-farms.net.

Provided by University of Georgia (news : web)