

Report details multiple commercial uses of wireless sensor networks

February 25 2014

Managing the quality and quantity of freshwater resources is one of the most serious environmental challenges of the 21st century. Global population growth and increasing urbanization have resulted in increased competition for water resources among domestic, industrial, and agricultural users. Challenged to find ways to manage irrigation needs while recognizing the limitations of freshwater resources, many commercial horticulture operations are showing increased interest in the use of wireless sensor networks (WSN)—technology designed to both monitor and control irrigation events. A review published in *HortTechnology* highlights the recent advances in specific WSN technology and discusses implications for its use in commercial horticulture settings.

"Previous studies have demonstrated the utility of sensor-controlled irrigation," explained Matthew Chappell, lead author of the report. "The subsequent step in facilitating adoption of this technology has been the on-farm implementation of soil moisture-based irrigation hardware and software developed as part of the U.S. Department of Agriculture (USDA) Specialty Crops Research Initiative Project." Chappell and colleagues at the University of Georgia's Department of Horticulture reported on the implementation and use of these WSNs at three commercial nursery and greenhouse operations in Georgia.

The report focused on the use of capacitance-based soil moisture sensors to both monitor and control irrigation events. "Since on-farm testing of these [wireless sensor networks](#) (WSNs) to monitor and control irrigation

scheduling began in 2010, WSNs have been deployed in a diverse assortment of commercial horticulture operations," the authors said. They said that improved software and hardware have resulted from the challenges and successes experienced by growers, and grower confidence in WSNs has subsequently improved.

"Growers are using WSNs in a variety of ways to fit specific needs, resulting in multiple commercial applications," Chappell noted. "Some growers use WSNs as fully functional irrigation controllers. Other growers use components of WSNs, specifically the web-based graphical user interface (GUI), to monitor grower-controlled irrigation schedules."

"The case studies we documented exemplify the advancements that can be made in product development, deployment, and implementation when researchers work together with commercial growers," said Chappell. He noted that the research project has resulted in successful WSN implementation at three commercial nurseries in Georgia, which now trust and rely on WSN data not only to monitor substrate moisture but also to control irrigation. "Based on the positive experiences and comments from our grower collaborators, other growers have been eager to try WSNs in their operations."

The researchers concluded that the main factor limiting wide-scale adoption of is the lack of a commercially available WSN hardware and software designed specifically for the ornamental plant industry.

More information: *HortTechnology* December 2013 vol. 23 no. 6 747-753 horttech.ashspublications.org/...nt/23/6/747.abstract

Provided by American Society for Horticultural Science

Citation: Report details multiple commercial uses of wireless sensor networks (2014, February 25) retrieved 25 April 2024 from <https://phys.org/news/2014-02-multiple-commercial-wireless-sensor-networks.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.