GREENHOUSE GROWER

Get Smart, Get Integrated

Think beyond irrigation system timers and individual tech upgrades. Growers that embrace truly smart tools can gain real control over lost time, materials, and money.

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By Kristen Hampshire

The pressure points growers face are not anything they can control — cost and availability of labor, energy expenses, reduced margins. What are you going to do?

Well, there's technology. "Being able to deploy automation efficiently to reduce costs in whatever way possible helps offset those pressures," says Darren Ward, Manager, Business Planning and Commercialization at Vineland Research and Innovation Centre in Ontario, Canada.

One of the focuses at Vineland is helping greenhouses integrate technology into their production systems and conducting research projects.

Smart Irrigation Mimics Grower Behavior

Imagine an irrigation system that thinks and acts like you — a system that responds just like you would to plants' needs, if you could watch over every sprout of your inventory every minute of the day. This is true, smart irrigation, and it's so much more than greenhouse sprinklers on a timer. "Smart irrigation can actually capture the nuances of growers' decision making," Ward says.

Smart irrigation can be "trained" to think and act like a grower, resulting in significant time savings.

Vineland Research and Innovation Centre developed an artificial neuro-network using machine learning and artificial intelligence (AI). Basically, the system marries greenhouse climate data with growers' own watering decisions. "We run a growing 'training' cycle to bring in data to determine how the grower is watering," Ward explains.

From this training cycle, the smart irrigation system uses data to "understand" watering decisions: how and when the grower applies water. Then, the system can reproduce growers' behaviors. Basically, it thinks and acts like the best horticultural pro in the greenhouse.

The system is designed for potted crops including ornamentals and herbs, and it's making a cost-savings impact. When Vineland studied the amount of time growers

dedicated to scouting crops with the system in place, the center recorded a savings of more than 46 hours per acre, per year. “That’s a significant amount of time the grower does not have to run around to see if crops need watered,” Ward points out.

That’s the direct labor benefit. There are other crop quality and consistency advantages. “The system takes on the behavior of the grower who ‘trained’ it, so if you send your best grower out on the training cycle, it will implement their decisions in the entire greenhouse,” Ward says.

The system also produces a water and fertigation savings of up to 15 percent. “During the training cycle, the system will ignore or filter out any outliers or extraneous decisions, such as a grower erring on the side of caution in summer and putting in a little too much water in hot weather,” Ward says. “The system isn’t emotional or preventive. It’s based on cold, hard data.”

Water savings in these cases helps improve plant health, Ward says. “You can cut down on root-born diseases that happen when you over water.”

For example, Vineland observed one crop of ornamentals that received irrigation through the smart system. “At quality control, none were rejected or sent back to the greenhouse for further growing,” he reports. “And, the root structure of plants was better.”

Ward says smart irrigation “is on the cutting edge,” and Vineland is in the final testing stages of its system. It partnered with LetItGrow.org to implement the system in some of its greenhouses. The product is expected to go to market in fall 2019. Ward says, “This type of system can make dynamic decisions, just as a grower would.”

Integrating Systems— Analyze Before You Invest

Greenhouse technologies have evolved from “dumb, heavy machines” to smart, AI systems that capture and analyze data, predict and make decisions for growers. Plus, these systems can be controlled with the touch of a mobile app, says Omar Abdelzaher, Project Manager, Systems Integration at Vineland.

“Growers are looking to improve quality, reduce labor and waste, and increase efficiency, and that is what systems integration can help accomplish,” he says.

With all the different technologies on the market, how can growers connect disparate systems and create a single control platform? One of the worst things that can happen is getting a system that turns out not to be compatible with an existing system, Abdelzaher says. “Solid upfront planning and assessment is the first step and worth the time.”

ROI is always the key factor. Check into federal or provincial funding before making decisions. “They might save you a lot of equipment money and man-hours cost,” Abdelzaher says.

Growers should identify their needs — what do they want the machine or system to do? “It’s also very important to consider local service and support before you adopt a system or automation solution,” Abdelzaher adds. “That way, when you need service, you can get quick response time to keep production running.”

Really dig in to the operations and identify the production cost per operation for labor and energy. Identify the total waste percentage out of the production cycle. This will help reveal gaps where technology might be useful. “If growers don’t have time to do these analyses, they should seek advice or a consultant’s expertise,” Abdelzaher advises.

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