

# Innovation could give greenhouse cucumber growers a hand up

## Robotic harvesting tool uses touch to cut costs

By Luke Edwards

To demonstrate how his team overcame a significant hurdle in their quest to develop viable robotic cucumber harvesting technology, Brian Lynch looked down and put his hand in his pocket.

Despite not being able to see clearly what was in his pocket, his fingers could quickly identify his car keys, some loose change, and whatever else he happened to be carrying around with him that day.

The new tools Vineland Research and Innovation Centre will be showing off to those in the industry in October is based on that very simple premise: Sight gets you close, touch gets you precise.

“To build something that’s going to go exactly to that precise spot based on data from cameras is really challenging,” Lynch, director of horticultural technology services at VRIC said.

Back in 2018 Lynch and his team at VRIC began searching for robotic harvesting solutions for greenhouse cucumber growers. Whatever they came up with had

to be fast and accurate enough to make it worthwhile, but also at a price that meant a reasonable return on investment.

And that’s where the challenge came in. The latest cameras can do amazing work. Laser systems can also return wonderful data. However, they either cost too much, take too long, or both.

“From the very beginning the strategy in how we solved the problem was driven by constraints on the cost,” Lynch said. The goal, after all, is to produce something that growers will be able to buy.

So instead of focusing all of its attention on the “vision” of the robot, Lynch’s team opted to use the cameras to get them close, and then develop a new tool to finish the job.

“It feels its way to the stem, so that means we don’t have to know where the stem is, we just have to know where the cucumber is. And that’s a lot easier of a problem to solve,” he said.

A closed loop system finds the cucumber, working its way from the bottom of the vegetable to the top. Once the hand has detected it has reached the top, a cutting de-



Vineland Research and Innovation Centre is working to develop robotic cucumber harvesting technology. In the photo is Brian Lynch, director of horticultural technology solutions. ~ Luke Edwards photo

vice snips the stem and the hand places the freshly cut cucumber in a bin.

“We’ve got to make sure the technology we’re using relies on simple components,” Lynch said.

Other camera-focused systems carry plenty of risk, he added. Leaves can get in the way, or worse yet, the device can get mistaken between the stem and the main vine. Lynch said he’s heard stories of harvesting devices that killed plants after cutting what it thought was a stem.

The system produced by VRIC has no risk of that, he said.

Additionally, Lynch said it’s far easier for camera systems to identify the cucumber rather than differentiate between leaves, stems and vines. Ultimately, Lynch said his job is to innovate products that are a benefit to the industry, grow-

ers, and in the end, consumers. With labour, and especially skilled labour, an ongoing challenge for growers, this technology could be a solution.

The goal now is to find some partners to get a product ready for commercialization. The focus for Lynch was developing the specific harvesting tool. Existing chassis technology could be adapted or otherwise used to round out a complete product.

In October, staff will be welcoming industry members to the VRIC campus for demonstrations of the technology. It’s happening at the same time as the Canadian Greenhouse Convention, which takes place in Niagara on Oct. 9 and 10. Industry members interested in registering can visit here: <https://tinyurl.com/2p9w3fwu>.

Predicting when a product might actually be available is always a challenge, but Lynch is hopeful it could happen in a couple years. One thing he’s realized during this work is that the adoption of robotic technology is something of a two-way road. As much as his team and others like him are trying to create tools that work in current greenhouse settings, future greenhouse and greenhouse vegetables can be considered with robots in mind. That means facilities that are built with robotic needs in mind. It also means changing caretaking techniques to have plants that work better with robots or even developing new varieties that remove plant characteristics that stump robot devices. 🌱



This is what a finished product could look like when VRIC finds the appropriate partners to build out its robotic cucumber harvesting device. ~ VRIC photo

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