Leading the way on automation

Finding workers to help grow and harvest full crops of buttons, cremini and portobello is a serious challenge for the mushroom industry.

"It's hard work requiring training and there simply isn't the labour pool available to draw from," explained Tania Humphrey, Vineland's director of strategic planning and research management.

But mushroom growers aren't the only ones having a hard time finding help.

Availability and cost of labour are two of the greatest challenges facing growers today, especially in horticulture.

Labour is the biggest cost of doing business, making it difficult for producers to expand operations, survive wage increases and compete with cheaper imports.

"It's pushing the limits of profitability for some growers," Humphrey said. "In horticulture, most tasks are still done by hand. It's not like field crops where large-scale operations can be handled by machine."

Thanks to a significant grant from Agriculture and Agri-Food Canada, Vineland is positioned to transform farm labour and change the prospects of growers in the process.

The investment formalizes Vineland as the centre of an agricultural automation cluster, overseeing a national network to develop automation, artificial intelligence and precision technology to improve productivity.

The new cluster will focus on creating technologies that can replace or augment human labour, and improve yield and efficiency by harnessing big data and artificial intelligence, which growers can use to make more informed management decisions.

"For Vineland, this is a big deal to build nationally and test the waters beyond horticulture," Humphrey noted.

So far, three cluster projects led by Vineland researchers have received funding to move them through experimentation and into the prototype phase. They are:

- A robotic mushroom harvester that will increase productivity and improve yield and quality of harvested mushrooms via intelligent, selective harvesting.
- Smart greenhouse irrigation that can monitor water status in floral and potted vegetables and decide when to water plants. This will reduce water consumption and ensure plants are watered based on need, not the grower's perception.
- An automated cucumber harvester to replace human labour and improve yield and quality by using big data to optimize plant management and harvesting decisions.

"There's still a lot of work before transferring technology to growers but that's the purpose of the cluster," Humphrey said.

Then it's a matter of licencing a manufacturer to produce the technology, she noted, making the cluster work beyond agriculture.

"We see this as a win-win for agriculture and manufacturing. It's good for Canada, too. The expertise, the companies, the people are here. It's getting the manufacturing sector to focus on agriculture."

Humphrey and Vineland are currently seeking projects in other sectors starting in 2019. The ideas used to solve labour issues on one type of farm may benefit others, she noted.

"There will be a lot of overlap in skills and research with what's happening in horticulture," Humphrey said. "We need to begin discussions now and get these projects underway."

Mohamed Kashkoush, Vineland's data mining & optimization research scientist and Tania Humphrey, Vineland's strategic planning & research management director

"...For Vineland, this is a big deal to build nationally and test the waters beyond horticulture."