

Canadian Agri-Science Cluster for Horticulture 3



Update to Industry

2019-2020

<p>Activity title: Reduced production cost and enhanced labour efficiency using the Guelph Intelligent Greenhouse Automation System</p>
<p>Name of Lead Researcher: Medhat Moussa, University of Guelph</p>
<p>Names of Collaborators and Institutions: University of Guelph, Ontario Greenhouse Vegetable Growers Association, BC Greenhouse Vegetable Growers association, AMCO farm</p>
<p>Activity Objectives (as per approved workplan): The overall objective of this project is to develop, and field test an autonomous integrated prototype for a harvesting/de-leafing robot in vegetable greenhouses. The specific objectives are:</p> <ul style="list-style-type: none"> • Large scale field testing of a plant monitoring and labour quality assurance system • Large scale field testing of tomato and pepper fruits detection and localization under occlusion and various environmental conditions. • Large scale field testing of harvesting operations. This will focus on beefsteak tomato and sweet pepper and expand later to cucumber and cluster tomato. • Large scale field testing of de-leafing operation in tomato greenhouses • Knowledge transfer and commercialization of the technology.
<p>Research Progress to Date (use plain language): During the 2019-2020 year, we focused on field testing of a new prototype in a major commercial greenhouse. These tests started in Sept. 2019 and included operational and data collection testing. The operational testing validated the hardware design to ensure that the robot can reliably and safely navigate between greenhouse rows and operate various cameras and sensors. The data collection testing collected a large amount of data, processed it and store the results in a database. Based on the field testing, we modified the design and were ready for a second round of testing in March 2020. Unfortunately, these tests are currently on hold due to restrictions related to the COVID-19 situation. We expect to be in the field once the situation improves, maybe toward the end of summer 2020.</p>
<p>Extension Activities (presentations to growers, articles, poster presentations, etc.):</p> <ul style="list-style-type: none"> - Invited presentation to Young Farmers Forum. Title: Robotics in Agriculture: challenges and opportunities, Hamilton, Ontario, 2019 - Invited presentation to Canadian Horticultural Council Board of Directors. Title: Reduced production cost and enhanced labor efficiency using the Guelph Intelligent Greenhouse Automation System, Milton, Ontario, July 2019.

- Invited presentation to Agri-Food Excellence Symposium. Title: Robotics in Agriculture: Challenges and opportunities, Guelph, 2019.
- Magazine article in Farmtario Magazine. Title: Robotics for greenhouse tomato harvest by Lilian Schaer, Nov. 2019.
- Magazine article in Greenhouse Canada. Title: Robotics and automation could address production challenges by Melanie Epp, Nov. 2019
- Magazine article in The Grower. Title: Testing a scouting robot by Karen Davidson, Sept. 2019
- Presentation at 2020 Horticulture Growers' Short Course @ Pacific Agriculture Show

Early Outcomes (if any) or Challenges:

The main challenge we have at this time is related to access to operational facilities to do more testing due to COVID 19. I believe this will be a temporary situation.

Key Message(s):

COVID 19 have exposed Canadian growers to the risks of relying on temporary foreign workers. This project aims at automating the most demanding tasks in a greenhouse which would help mitigate against these risks.

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