Canadian Agri-Science Cluster for Horticulture 3

Update to Industry

2020-21 – Semi-Annual

Activity title: Activity 7: Reduced production cost and enhanced labour efficiency using the Guelph Intelligent Greenhouse Automation System
Name of Lead Researcher: Medhat Moussa, University of Guelph
Names of Collaborators and Institutions: University of Guelph, Ontario Greenhouse Vegetable Growers Association, BC Greenhouse Vegetable Growers association, AMCO farm
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: • 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.
Research Progress to Date (use plain language, not to exceed 500 words): Due to COVID 19 restrictions including difficulty in accessing commercial growers in Leamington and our lab at the University of Guelph, research activities have shifted to developing a full simulation of a greenhouse environment. This will allow testing of various robotics harvesting and robotics de-leafing to be conducted in simulation. Towards this end, we are planning to work with our collaborating growers to set up imaging equipment that can take 3D images of the greenhouse environment. The 3D images will help ensure that the simulation environment is as realistic as possible. This is expected during Dec. 2020.
Extension Activities (presentations to growers, articles, poster presentations, etc.): Unfortunately, none to report.
COVID-19 Related Challenges: COVID-19 restrictions have severely impacted our access to growers' facilities in the Leamington area. Growers were not interested in any large team that may lead to a breakout of COVID-19 in their facilities specially that Leamington as a whole was hard hit. Furthermore, the University of Guelph research office issued guidelines that limit onsite and offsite research work. As such we had to pivot developing specific simulator to continue our work in a safe manner.

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.