

## **Integrated Pest and Disease Management in Greenhouse Crops**

- 2016-2018 Cucumber Green Mottle Mosaic Virus (CGMMV) management training programs.**
- Project leader: W. Ellouze
  - Project Team: R. Howard (RJH Ag Research Solutions Ltd.), W. Zhang, S. Dalpé & V. Mishra.
  - Funding: Growing Forward 2 Business Development Initiatives.
  - Objective: To train commercial cucumber greenhouse growers and packing house operators in Alberta in the use of Best Management Practices (BMP) for the control of CGMMV.
- 2016-2017 CUCUMBER GREEN MOTTLE MOSAIC VIRUS PROJECT – PHASE II.**
- Project leader: W. Ellouze
  - Project Team: W. Zhang & V. Mishra.
  - Funding: Alberta Crop Industry Development Fund (ACIDF) Ltd.
  - Objective: To evaluate the effectiveness of the sanitization/disinfection procedures practiced in commercial greenhouses and develop novel or improved methodologies to control and/or eradicate the CGMMV.
- 2016-2017 DEVELOPING SUSTAINABLE METHODOLOGIES FOR MANAGING TOMATO SPOTTED WILT VIRUS (TSWV) DISEASE IN ALBERTA GREENHOUSES USING BEST MANAGEMENT PRACTICES.**
- Project leader: W. Ellouze
  - Project Team: W. Zhang, S. Dalpé & V. Mishra.
  - Funding: Alberta Agriculture and Forestry.
  - Objective: To provide the methodology for an effective and efficient TSWV disease management through surveillance and varietal screening to help minimize economic losses and sustain the profitability of commercial greenhouse growers in Alberta.
- 2016-2016 EVALUATION OF SANIDATE 5.0 DISINFECTANT FOR EFFICACY AGAINST CGMMV AND CLAVIBACTER MICHIGANENSE.**
- Project leader: W. Ellouze
  - Project Team: V. Mishra & V. K. Choppakatla (BioSafe Systems).
  - Funding: BioSafe Systems & Alberta Crop Industry Development Fund (ACIDF) Ltd.
  - Objective: To evaluate the effectiveness of disinfectants manufactured by BioSafe Systems Company to control and/or help eradicate CGMMV and bacterial canker diseases.
- 2016-2016 EVALUATION OF STRIP-IT AND KLEENGROW DISINFECTANTS FOR EFFICACY AGAINST GMMV.**
- Project leader: W. Ellouze
  - Project Team: V. Mishra & W. Martin (Pace Chemicals Ltd.).
  - Funding: Pace Chemicals Ltd. & Alberta Crop Industry Development Fund (ACIDF) Ltd.
  - Objective: To evaluate the effectiveness of disinfectants manufactured by Pace Chemicals Company to control and/or help eradicate CGMMV.
- 2015-2018 ALBERTA NEW GREENHOUSE GROWERS' BUSINESS MANAGEMENT TRAINING PROGRAMS.**
- Project leader: W. Zhang
  - Project Team: W. Ellouze, N. Mohammed, S. Dalpé & Z. Pan.
  - Funding: Growing Forward 2 Business Development Initiatives.
  - Objective: To train the new Alberta greenhouse growers in business management skills and to increase their profitability.
- 2014-2016 CUCUMBER GREEN MOTTLE MOSAIC VIRUS AND ITS MANAGEMENT IN ALBERTA GREENHOUSES.**
- Project leader: W. Zhang

- Project Team: W. Ellouze, K-S. Ling (USDA-ARS, USVL) & R. Howard (RJH Ag Research Solutions Ltd.)
- Funding: Alberta Crop Industry Development Fund (ACIDF) Ltd.
- Objective: To provide the methodology for an effective and efficient CGMMV disease management in Alberta commercial greenhouses.

Contact Walid Ellouze at 403-362-1328 or [w.ellouz@gov.ab.ca](mailto:w.ellouz@gov.ab.ca) for more information.

### **Technology Transfer of Greenhouse Aeroponic Lettuce Production Information to Alberta Growers**

Nabeel Mohammed

The purpose of this project is to provide producers with information to make business decisions related to greenhouse lettuce production. Alberta's greenhouse industry (127.5 ha) is ranked fourth in the country after

Ontario (1,330 ha), British Columbia (531 ha), and Quebec (262 ha). Lettuce is one of the most commonly grown greenhouse vegetables in Alberta after cucumbers, tomatoes, peppers with 28 growers and an area of 6,842m<sup>2</sup>.

No commercial greenhouses currently use an aeroponic growing system for lettuce production

in Alberta, yet this growing method offers numerous advantages.

Producers are interested in using greenhouse space more efficiently to achieve greater yield

and economic returns per square meter.

Aeroponic production can increase greenhouse production significantly and

potentially double-up the profit margin.

This project provides technical information to lettuce producers about improved production quality, nutrient management and water use efficiency to enhance the long-term competitiveness of their operation. The project supports active technology transfer in terms of

peer-to-peer learning, workshops and presentations. We plan to use the systems and the participant feedback from training exercises to develop a framework for a lettuce production manual for Alberta.

Project funders: Growing Forward 2

### **Evaluating day neutral strawberries in soilless culture for greenhouse production in Alberta**

Nabeel Mohammed

Strawberries are grown in all provinces of Canada; the largest areas of production in Quebec (36%), Ontario (32%), British Columbia (15%), Nova Scotia (8%) and

Alberta (2%). There is no current scientific research on greenhouse strawberries in Alberta.

The industry is seeking production information about specific new crops to be grown in soil-less culture and generate revenue by introducing and testing new

varieties. Strawberry production was identified in a recent ACIDF Greenhouse Industry research priorities document as a crop with potential for Alberta growers.

Feedback from Red-Hat growers, Alberta Greenhouses Grower Association (AGGA), Alberta Farm Fresh Producers Association (AFFPA), local communities indicated that they preferred to support the evaluation on

growing a commercial hydroponic system for greenhouse strawberries with the interest in several of the varieties for potential in-season extension and out of season availability.

Funders: Alberta Crop Industry Development Fund



Contact Nabeel Mohammed at 403-362-1313 or [nabeel.mohammed@gov.ab.ca](mailto:nabeel.mohammed@gov.ab.ca) for more information.

**Intra-Canopy Lighting -LEDs Examination and Practice for Sustainable Vegetable (Cucumber and Tomato) Production in Alberta**

Saeid Mobini, Mark Lefsrud (McGill), Emmanuel Anum Laate, Guang Pan, Shannon Petersen, Marlon Anoso (Alberta Agriculture and Forestry)

This project has focused on extensive testing of intra-canopy lighting LEDs system at commercial level. Applying the new lighting system may directly enhance innovation through assessing the efficiency of this new technology and demonstrating its feasibility and potential in crop yield improvement. This project will address challenges facing

greenhouse growers in Alberta regarding year-round production and energy saving. It ultimately supports further innovation opportunities by providing fundamental information for future business decisions such as investment, commercialization, and strategic direction on greenhouse lighting system in Alberta.

**Objectives:**

*To determine and demonstrate the effect of light supply on microclimate in relation to plant growth*

*To illustrate the effect of light source on energy use efficiency and yield improvement*

*To explain the effect of lighting treatments on leaves' edema and fruit quality*

*To estimate the cost of electricity and cost-effectiveness of intra-canopy lighting -LEDs compared to overhead lighting-HPS*

*To arrange workshops and demonstration events for transferring LED technology for cucumber and tomato production to Alberta growers*

**Collaborators:**

AF researcher and specialists from Greenhouse Research Section, Economics Section, Climate Services Section, and

Faculty of Agricultural and Environmental Sciences, University of McGill

**Funders:**

Growing Forward 2,  
Alberta Crop Industry Development Fund Ltd.,  
Red Hat Co-operative Ltd.

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