



## Canadian Agri-Science Cluster for Horticulture 2

### Progress Report December 2014

Activity 2, Apple 1

**Utilizing Multiple Storage Technologies to Improve Efficiency, Reduce Energy Consumption, and Extend the Availability of Canadian Apples for Domestic and Export Markets**

#### Lead Researcher

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#### Activity Objectives

- Methods to control CO<sub>2</sub> injury without using diphenylamine (DPA)
- Evaluations of DPA residues on fruit and within storage facilities
- Optimizing storage regimes for 'Honeycrisp' and 'Gala'
- Effects of cooling rate on apple quality after storage

#### Research Progress to Date

The following experiments/trials associated with the various objectives have been completed. Data have been analyzed and a detailed report for Year 1 is currently being compiled.

##### Objective 1

- 1.1 – Assessment of external CO<sub>2</sub> injury development in 'McIntosh' apples.
- 1.2 – Evaluation of low O<sub>2</sub> storage for 'Empire' apples.

##### Objective 2

- 2.1 – Nine commercial rooms with or without recent exposure to DPA were tested for DPA residue.
- 2.2 – DPA-treated 'Empire' apples with and without SmartFresh treatment were tested for DPA residue throughout long-term air storage.

##### Objective 3

- 3.1 – Effects of air flow on disorder development in 'Honeycrisp' during storage.
- 3.2 – Evaluation of delayed controlled atmosphere (CA) storage for 'Honeycrisp' apples.
- 3.3 – Assessment of low O<sub>2</sub> storage for several 'Gala' strains.
- 3.4 – Effect of SmartFresh treatment on 'Gala' apples after low O<sub>2</sub> storage.

##### Objective 4

- 4.1 – Interactions of harvest maturity, cooling rate, and SmartFresh treatment on 'McIntosh' apple quality during long-term CA storage.
- 4.2 – Interaction of cooling rate and SmartFresh treatment on 'Gala' and 'Empire' quality during long-term CA storage.

#### Early Outcomes or Challenges

Timelines for some planned work were impacted by delays in initiation of the Cluster program.

**Key Message(s)**

This project is based on various discussions with several apple packers and industry experts throughout Canada. The objectives represent requests for more information and research on certain subjects that tend to be common among the apple producing provinces. ***The project will generate essential knowledge for the Canadian apple industry, pertaining to major storage issues that are currently affecting apple quality, storage life, and marketability.***