



Apple Research Activities

The apple group has two research activities with the Canadian AgriScience Cluster for Horticulture Cluster 4. These two activities are focused on helping apple growers across Canada protect their orchards and be more productive and sustainable.

THE CLUSTER 4 APPLE RESEARCH ACTIVITIES ARE:

ACTIVITY 4

Reducing losses from apple pests with alternative control strategies

LEAD RESEARCHER – Suzanne Blatt, research scientist in entomology with Agriculture and Agri-Food Canada at the Kentville Research and Development Centre

ACTIVITY 5

Apple crop load management: enhancing thinning predictability and tree response through advancements in modelling and new precision thinning products, strategies and technology

LEAD RESEARCHER – John A. Cline, professor of tree fruit physiology at the University of Guelph

This project is generously funded through the Canadian AgriScience Cluster for Horticulture 4, in cooperation with Agriculture and Agri-Food Canada's AgriScience Program, a Sustainable Canadian Agricultural Partnership initiative, the Fruit and Vegetable Growers of Canada (FVGC), and industry contributors.



Reducing Losses from Apple Pests with Alternative Control Strategies



LEAD RESEARCHER

Suzanne Blatt

Research entomologist with Agriculture and Agri-Food Canada at the Kentville Research and Development Centre

This research aims to reduce apple crops losses from pests such as apple maggot, ambrosia beetles and leafrollers. The research team is investigating a protocol for sterile insect release for control of apple maggot (SIR for AM) to determine the potential for this strategy as a viable option for management. Ambrosia beetles are being identified in apple orchard agroecosystems, along with new methods to manage the pest. Researchers are also working to find a sustainable non-pesticide tool for management of leafrollers. The purpose of each aspect is to identify a non-pesticide option for control of apple pests across Canada.

Throughout the winter, SIR experiments focused on optimizing an artificial diet to facilitate the mass rearing of apple maggot. Last year, ambrosia and bark beetles were collected from the field and identified. Landscape data was analyzed to determine options to explore in this growing season.

The SIR research team is identifying the ratio of sterile to wild flies needed to reduce stings from apple maggots under field conditions. This is the final year for this work, and a recommendation on the

commercial potential will be made. Landscape factors have been identified and trials are underway to review modifications needed to reduce ambrosia and bark beetle populations. The release device for leafroller biocontrol is being field tested in Quebec with field trials in Nova Scotia and British Columbia planned for next year.

The ambrosia and bark beetle research team has discovered the presence of a new species in Ontario. The team discovered the species causing damage in B.C. is different from species in Ontario. This discovery helps researchers better understand the impact species may have on orchards at different times and in different ways. This research will allow growers to target their management practice for the species causing damage in their region.

KEY TAKEAWAYS:

- The SIR research team is identifying the ratio of sterile to wild flies needed to reduce stings from apple maggots, with a recommendation on commercial potential to be made soon.
- Landscape factors have been identified, and trials are underway to identify modifications needed to reduce ambrosia and bark beetle populations.
- Researchers discovered that the species of ambrosia and bark beetles causing damage in British Columbia is different than the Ontario species.



The biocontrol agent in the blue barrel is hooked into the existing spray equipment with the green hoses channeling the agent through the sprayers. Photo: Daniel Cormier



Insecticide treatments have been applied to tree bolts with ambrosia beetle entry holes circled.

Photo: Justin Renkema





Apple Crop Load Management: Enhancing Thinning Predictability and Tree Response Through Advancements in Modelling and New Precision Thinning Products, Strategies and Technology



LEAD RESEARCHER

John A. Cline

Professor of tree fruit physiology
at the University of Guelph

This research activity is aimed at thinning flowers or fruits on overloaded apple trees using new chemical thinners and technologies. Following the first year of trials, the research teams are repeating and refining tests this year to evaluate how the strategies work under different environmental conditions.

This year, the weather conditions in both study locations were unusual and will contribute valuable information about temperature extremes. In Ontario, the cool conditions during early fruit development made chemical thinning atypical, and in Nova Scotia, above-average temperatures suggested a risk of overthinning.

At the Ontario Crops Research Centre in Simcoe, Ont., the research team is conducting thinning experiments using single and sequential sprays and tank mixes of metamitron and ACC (Accede 40SG). They are also investigating computer vision technologies and have worked on using thinning prediction models including the fruit growth and carbohydrate models. The team is currently conducting an experiment using RIMpro's weather carbohydrate model and BreviSmart decision support software.

This past spring at Walsh Farms in Berwick, N.S., the amount of flowering on trees in response to last year's thinning trials was assessed. Treatments were then repeated from last year on Honeycrisp and Gala trees using varying rates and new chemistries. The research team monitored the forecasts and final predictions made by the decision support systems RIMpro and BreviSmart. Specific attention was paid to the predictive ability of the models and the regional limitations.



Cold and cloudy conditions in spring 2025 slowed the rate of fruit growth after flowering in southern Ontario causing chemical thinners to not work as well.



Measuring fruit size on trees in southern Ontario in spring 2025.

Photos: John Cline





KEY TAKEAWAYS:

- Researchers are conducting an experiment using RIMpro's weather carbohydrate model and BreviSmart decision support software at the Ontario Crops Research Centre and at Walsh Farms in Nova Scotia.
- In Ontario, single and sequential sprays and tank mixes of metamitron and ACC are being evaluated for efficacy in thinning Gala and Ambrosia apple trees.
- In Ontario, computer vision technologies and predictive models are being tested for their ability to improve crop load management.



Measuring the size of fruit on trees in southern Ontario in spring 2025. Photo: John Cline

