



Apple Research Activities

There are two research activities that are part of the apple group for the Canadian AgriScience Cluster for Horticulture Cluster 4. These two activities are focused on finding ways to help 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, new precision thinning products and 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 scientist in entomology with Agriculture and Agri-Food Canada at the Kentville Research and Development Centre

This research is working to find cultural, biological and sterile insect-release strategies to control bark beetles, leafrollers and apple maggots on apple trees. To date, two of the three studies are underway including sterile insect release for control of apple maggot (SIR for AM) and cultural practices to manage ambrosia beetles. Cultural practices are management methods which are physical rather than chemical in nature, such as removing dead dying trees from an orchard.

Over the past year, as part of the SIR study, the ratios of sterile to wild flies needed to stop apples from being stung has been assessed. For the ambrosia beetles, researchers are reviewing which beetle species will attack young apple trees and what makes an orchard more susceptible to an attack. Dying apple trees have been collected from orchards with the emerging ambrosia beetles counted and identified. Researchers have also gathered beetles from dying trees in woodlots adjacent to orchards. There have been attempts to raise ambrosia beetle species for further study.

Over the winter, researchers will continue work on developing a cost-effective diet for mass rearing of apple maggots as part of the SIR work. The results from the field and laboratory ratio studies will be reviewed with next year's field trials planned accordingly. For ambrosia beetles, researchers will identify and count all collected beetles, data will be analyzed which will help with creating the plan for the next growing season.

KEY TAKEAWAYS:

- SIR for AM — all work is being conducted on site at the AAFC Kentville Research and Development Centre in Nova Scotia.
- Ambrosia beetles — research is being done at commercial apple orchards across Ontario and in the Okanagan Valley of British Columbia.
- There are six ethanol traps set up at each of the ambrosia beetle locations in Ontario and British Columbia. Traps were checked weekly between May and September with beetles identified, counted and saved for further evaluation.
- The warm winter and early spring may have led to early emerging ambrosia beetles not being caught, as researchers didn't place traps until early or mid-May when first emergence usually happens.



FAR LEFT: A BugDorm where sterile flies emerge from sand post-sterilization in preparation for use in laboratory or field studies. LEFT: A BugDorm containing 10 pairs of sterile flies and one pair of non-sterile flies in order to determine the ratio of sterile to non-sterile to prevent stings on apples.

Photos: Suzanne Blatt





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



LEAD RESEARCHER

John A. Cline

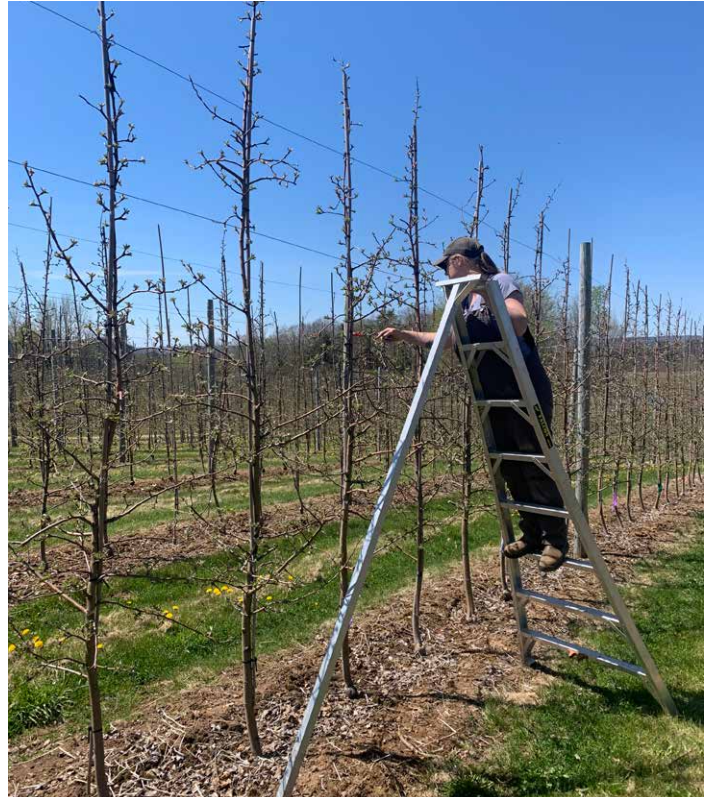
Professor of tree fruit physiology
at the University of Guelph

This research activity is aimed at thinning flowers or fruits on overloaded apple trees using new chemical thinners and technologies. Researchers are working to develop and use decision support systems to improve the management of apple crop loads. The researchers are also looking at artificial intelligent-based computer vision systems to aid in managing and measuring the response to crop load decisions.

At the Ontario Crops Research Centre in Simcoe, Ont. experimental treatments were applied to apple trees last spring. Throughout the growing season measurements of apple fruit growth and development were taken. Fruit was harvested in September with further data analyses happening during the winter.

At Walsh Farms in Berwick, N.S. a trial site with Gala and Honeycrisp apples was set up at a grower's orchard with the site and research activities led by Perennia. Throughout the thinning season decision support systems, RIMPro and BreviSmart, were monitored for accuracy. Thinning treatments were applied to full trees at the target fruit sizes. Fruit load of blossom clusters and the final number of fruits per cluster following natural and treatment-induced fruit drop were recorded. The research team also reported the time it took to hand-thin apples to the desired crop load.

To date it was found that the decision-support tool RIMPro's model predictions were only as reliable as forecasted. While the predictions fluctuated the models did give insights into the thinning process. The chemical thinners had notable activity in trials and throughout the industry and further evaluation will be completed this winter.



TOP: Initial counts of apple blossoms on May 15, 2024 at Walsh Farms in Berwick, N.S.

ABOVE: Apple blossom on trees at Walsh Farms in Berwick, N.S.

Photos: Michelle Cortens





Initial fruit sets on apple trees at Walsh Farms in Berwick, N.S.

Photo: Michelle Cortens



Ambrosia flowers at bloom on an apple tree at the Ontario Crops Research Centre in Simcoe, Ont. Photo: John A. Cline

KEY TAKEAWAYS:

- The response of apple trees to experimental chemical thinners and thinning models is being evaluated.
- At the Ontario site, there was excellent bloom, heavy fruit set, and good growing conditions.
- At the Nova Scotia site, there was a good bloom and influence of chemical thinners. Model predictions were monitored and appeared to offer good insight but practical limitations were noted.

