2025 Annual Report: Nova Scotia Site

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

Project Year 2 of 3

March 31, 2026

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Introduction

The current report is a progress update that summarizes the results of the second year of a three-year project in 2025. In year two, the results are preliminary and should be interpreted with caution. However, through this report we wish to share with industry our progress and early interpretations. The project is a collaboration led by Dr. John Cline, Professor of Pomology and Tree Fruit Physiology, University of Guelph, with field work done in Ontario and supported by additional field work in Nova Scotia representing Eastern Canada by Michelle Cortens, Tree Fruit Specialist, Perennia. The current report summarizes only the Nova Scotia site.

The project was developed to offer new strategies and products that adjust the crop load of apples which will result in labour savings, improved fruit quality and a higher percentage of fruit reaching the market. Fruit trees overproduce flowers for commercial purposes and the excess fruits are removed by hand thinning or by chemical thinning. Hand thinning is increasingly challenging due to long pesticide re-entry intervals and increasing wage rates, with labour accounting for a large percentage of production cost. Chemical thinning involves foliar sprays that enhance natural fruit shedding early in the season when the greatest improvements to fruit quality can be realized. Overall, successful crop load management improves a farm's economic sustainability and global competitiveness.

Research has revealed that two new products have activity as chemical thinners. The ethylene precursor 1-aminocyclopropane-1-carboxylic acid (1-ACC) triggers ethylene production and stimulates fruit drop (Valent BioSciences 2022). The application timing for this compound is believed to be later than the typical thinning window and local success has been variable. Valent Canada Ltd registered 1-ACC (Accede™) in Canada in late 2023 resulting in some on-farm use in 2024 and 2025. Another new compound is metamitron that was originally marketed as an active herbicidal ingredient and works by inhibiting photosynthesis, thereby increasing competition between fruitlets (McArtney et al 2012). Adama Canada Ltd registered metamitron as the Brevis® formulation in Canada in late 2025. Both Accede and Brevis have been included in previous research in Nova Scotia through public and private funding to support growers as they attempt to gain more experience and answer questions for a complex management strategy.

The response to chemical thinners is affected by many factors so the thinning outcome can be variable. The main tree factors are cultivar, tree age and health, and the amount of bloom (Schwallier 1996). The main weather factors are temperatures during and shortly after the spray, overcast or sunny conditions, and humidity and precipitation (Schwallier 1996). The influence of thinners was relatively unpredictable until recent work suggested a relationship with carbohydrate availability. Sunny and cool weather conditions limit demand for and promote carbohydrate production whereas cloudy and warm conditions use supplies and impede carbohydrate production (Robinson and Lakso 2011). It was suggested that the supply and demand of carbohydrates during the post-bloom stage of fruit development influences the outcome of chemical thinning.

By modeling the weather factors that influence carbohydrate status of the tree, researchers made sense of some of the fluctuating variability of thinning to inform application rates (Robinson and Lakso 2011). The model requires inputs such as temperature, solar radiation, and bloom time. The model known as the Cornell Apple Carbohydrate Thinning Model is available in the United States through NEWA.cornell.edu but is unavailable in Canada due to lack of integration with Canadian weather forecasts.

An alternative carbohydrate model is available in Canada through RIMpro. RIMpro (www.RIMpro.cloud) is a decision-support system developed in Europe with a carbohydrate thinning model for fruit growers. The model is run using Nova Scotia on-farm weather station data and risk predictions are made using weather forecasts from a web-based meteorological service (Meteoblue) that generates weather forecasts. The proprietary model requires a user account for a fee of €300 per year per station (approximately $484 CAD at the time of writing).

Furthermore, Adama has developed a carbohydrate-based decision-support tool on a platform called BreviSmart. The model incorporates web-based meteorological data of historical and forecast temperature, solar radiation, fruit diameter, and cultivar to recommend adjusting rates of Brevis by +/- 30%. Evaluating these decision-support tools will determine if there are optimum thinning opportunities or whether treatment rates should be adjusted to account for weather influences and improve the effectiveness of thinning programs.

This interprovincial project has several objectives, and the two objectives addressed at the Nova Scotia site are to,

1. Compare and validate crop load management (computer) models to predict and improve thinning outcomes using chemical thinners, and
2. Determine the effect of chemical thinning products, different timings, and concentrations on fruit thinning efficacy of apple.

To address these objectives, field trials were implemented in the 2024 and 2025 seasons. In the 2025 season, field trials were placed at the opposite end of the orchard rows as the prior year, on previously unused trees, to avoid carryover effects. The Honeycrisp trial site was set-up in a 2019 planting on EMLA.26 rootstock with a tree spacing of 0.76 m x 3.7 m (2.5’ x 12’) and a tree density of 3,588 trees/ha (1,452 trees/acre). The Gala trial site was set-up in a 2019 planting on G.41 rootstock with a tree spacing of 0.69 m x 3.7 m (2.25’ x 12’) and a tree density of 3,986 trees/ha (1,613 trees/acre). The trial rows were immediately adjacent in a block at Walsh Farm Inc. in Rockland, Nova Scotia (45.0241389, -64.694500). The site consists of Torbrook soil (NSTBO2~~~~A) that is (R) rapidly drained. It is a coarse soil with 85% sand, 13% silt and 2% clay in the top 15 cm layer and 95% sand, 3% silt and 2% clay to 60 cm deep (source: https://sis.agr.gc.ca/cansis/soils/ns/TBO/2~~~~/A/description.html).

Materials and Methods

The treatments were as follows in Table 1 and Table 2. The low and high rates of Fruitone were increased from +/- 20% to +/-30% of the standard, compared to the field trials in 2024. Also, the rate of Agral 90 tank mixed with Accede was increased from 0.05% to 0.125%. Each treatment area was set-up as a completely randomized block design with one-tree plots and replicated four times. Plot trees were selected for uniformity of tree size, health, and blossom density (Figure 1). Both trials were set-up on May 12, 2025. Refer to 'Appendix 1 – Experimental Design' for more information about plot layout and treatment randomization.

The treatments for each variety were in a single row and commercial applications were applied to the neighbouring rows in the opposite direction to limit drift. The trial areas were bordered by orchard on all sides. At least two guard trees separated each plot.

Table 1. Treatment List for Honeycrisp

Trt #	Treatment	Product Rate	Application Timing (King fruit diameter)	Notes
1	Untreated control	-	-	N.A.
2	Low standard: Carbaryl + NAA (-30%)	3 L Sevin XLR Plus + 263 ml Fruitone	A: June 4 (8.5 mm)	Application amount 1000 L/Ha
3	Standard: Carbaryl + NAA	3 L Sevin XLR Plus + 375 ml Fruitone	A: June 4 (8.5 mm)	Application amount 1000 L/Ha
4	High standard: Carbaryl + NAA (+30%)	3 L Sevin XLR Plus + 488 ml Fruitone	A: June 4 (8.5 mm)	Application amount 1000 L/Ha
5	Brevis (max rate)	2.3 L	A: June 4 (8.5 mm)	Application amount 1000 L/Ha
6	Brevis (max rate) + Fruitone (low)	2.3 L + 300 ml	A: June 4 (8.5 mm)	Application amount 1000 L/Ha
7	Accede + 0.125% Agral 90 (max rate)	400 PPM (1000 g in 1000 L water)	B: June 13 (17.7 mm)	Application amount 1000 L/Ha

Table 2. Treatment List for Gala

Trt #	Treatment	Product Rate	Application Timing (King fruit diameter)	Notes
1	Untreated control	-	-	N.A.
2	Low standard: Carbaryl + NAA (-30%)	3 L Sevin XLR Plus tank mixed with 375 ml Fruitone	A: June 4 (6.8 mm)	Application amount 1000 L/Ha
3	Standard: Carbaryl + NAA	3 L Sevin XLR Plus tank mixed with 535 ml Fruitone	A: June 4 (6.8 mm)	Application amount 1000 L/Ha
4	High standard: Carbaryl + NAA (+30%)	3 L Sevin XLR Plus tank mixed with 696 ml Fruitone	A: June 4 (6.8 mm)	Application amount 1000 L/Ha

Figure 1. Plot trees were selected for uniformity of tree size, health and blossom density in a high-density planting of Honeycrisp (left) and Gala (right). Photo taken on May 12, 2025.

Monitoring king fruit diameter and tree carbohydrate balance

The Gala and Honeycrisp trees were at the green tip stage of development around April 20 and reached full bloom by May 25. Fruit set after pollination was visually assessed and no unusual fruit drop occurred. However, it was common to see a notable size difference in the diameter of the king fruit versus lateral fruit due to a prolonged bloom period.

When a potential treatment opportunity was near, we measured average king fruit diameter on a random sample of 5 king fruit per tree on 10 representative trees across the trial area to target the ideal fruit size for treatment, with the guiding assumption that fruitlets grow 1 mm each day. Measurements of fruitlet diameter were also taken on June 4 and on June 13 on the day of treatment application.

The phenology settings input into the RIMpro model settings for 2025 were green tip on April 20, start of bloom on May 16, full bloom on May 25, and end of bloom on May 27. Fruit size was modeled over time for predictions of baseline thinning sensitivity. RIMpro model predictions used the Meteoblue forecast in combination with observed weather from on-farm Davis Instruments weather stations. The weather station 'Grafton NSFGA' at 9 km northeast of the trial (45°04'50.1"N 64°40'21.2"W) was referenced with a backup station available on the subscription in case of technical difficulties. Refer to 'Appendix 2 – Weather Records' for detailed seasonal weather information.

The BreviSmart model used web-based meteorological data and thinning predictions were informed by user inputs of king fruitlet size that were measured in the field. The forecast thinning report in 2025 was based on a fruitlet measurement of 9 mm on June 4.

Treatment applications

Thinner application A targeted 7 to 12 mm fruitlet diameter and application B targeted 15 to 20 mm. On June 4, treatments for application A were applied to entire trees when the king fruitlet diameter of Honeycrisp averaged 8.5 mm and Gala averaged 6.8 mm (Figure 2). On June 13, the Accede treatment for application B was applied to entire trees when the Honeycrisp king fruitlets averaged 17.7 mm in diameter. Hand thinning was implemented to entire trees throughout all treatments on July 22 for Honeycrisp and August 1 for Gala after the period of natural fruit drop was complete.

The common practice in Nova Scotia is to make only one thinner application when fruitlets are 7 to 12 mm in diameter. For direct comparison of Accede and Brevis to the standard practice of Sevin XLR + Fruitone, no repeat applications were made.

Figure 2. On June 4, a random sample of 5 king fruitlets from each of 10 trees gave an average fruitlet diameter of 8.5 mm for Honeycrisp (left) and 6.8 mm for Gala (right) on application timing A.

All treatments were applied with a Maruyama MD155 gas-powered backpack sprayer with a nozzle setting of 3. Trees were sprayed with an average water volume of approximately 1.2-1.3L – equivalent to 1000 L/ha. Refer to 'Appendix 3 – Application Information' for more detailed application information. No thinners other than the trial products were used. Insecticide and fungicide applications were made by the producer throughout the growing season according to standard practices for Nova Scotia.

Seasonal weather information was collected from the Grafton (NSFGA) weather station located approximately 9 km northeast of the trial location. The observed weather conditions after application A were favourable for thinning during the day and unfavourable at night with maximum/minimum temperatures of 26.3°C /7.0°C (Figure 3). In the four days following application, maximum air temperatures ranged from 19.7°C to 30.1°C whereas minimum temperatures ranged from 9.1°C to 14.7°C. For rescue thinning with Accede at Application B, the air temperatures were cool during the day and night with maximum/minimum temperatures of 17.9°C

/9.8°C (Figure 4). In the four days following application, maximum air temperatures ranged from 18.9°C to 24.3°C whereas minimum temperatures ranged from 4.8°C to 8.1°C. Early June was sunny with solar radiation levels high on most days following application A and B. Refer to ‘Appendix 2 – Weather Records’ for detailed seasonal weather information.

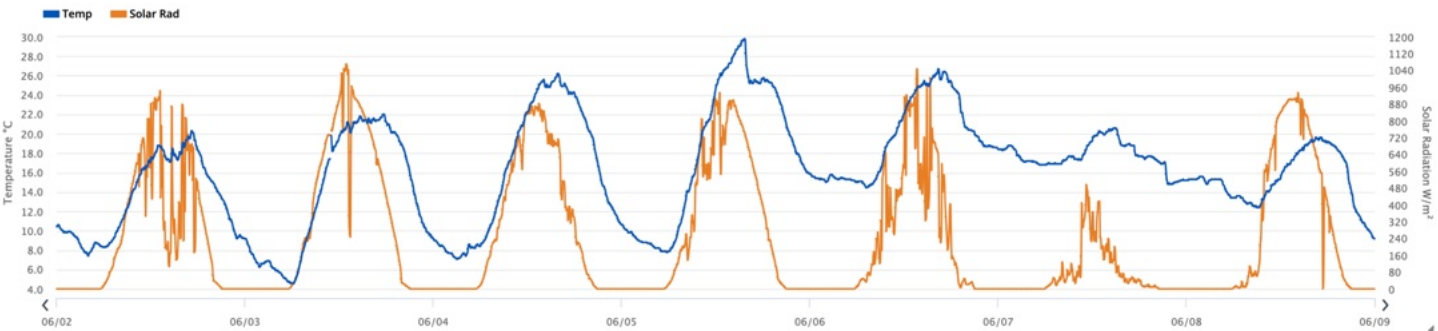


Figure 3. Temperature and solar radiation on the 2 days prior to application A on June 4 and the 5 days after application from Grafton (NSFGA).

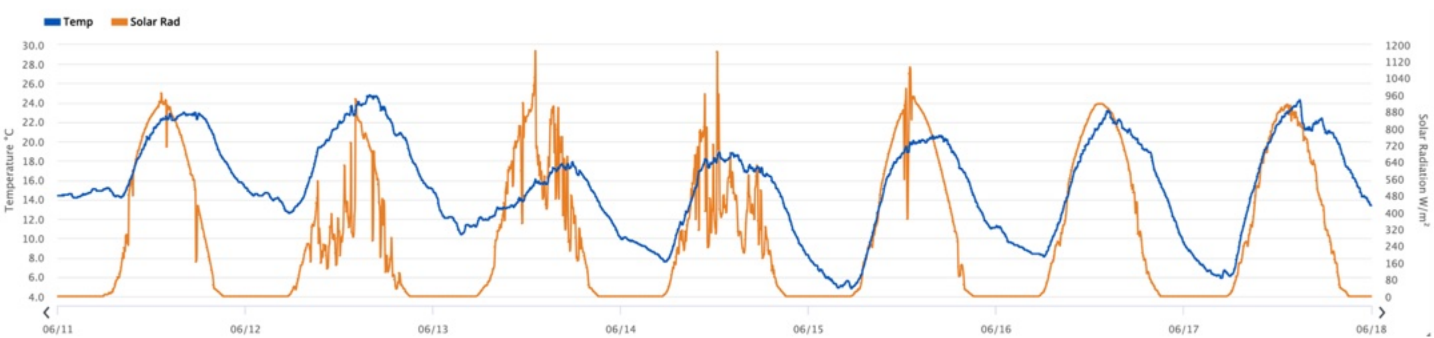


Figure 4. Temperature and solar radiation on the 2 days prior to application B on June 13 and the 5 days after application from Grafton (NSFGA).

Data Collection and Analysis

Return bloom

On May 12, 2025, the return bloom was evaluated during the bud separation to early pink stage of bud development. The total number of floral buds were counted in a sample area of 100 total clusters per tree. The percentage of 100 total buds that were floral was used as an assessment of the return bloom. The sample area included the blossom population at 1.5 m height. In the analysis of Gala data, replication 1 was excluded as an outlier that did not fit the requirements of the calculation.

Fruit set and crop load

Fruit set describes the fruit that will be retained by the tree for growth rather than be aborted by abscission. Fruit set was presented as the number of individual fruitlets that persist, after treatment and natural fruit drop, from the initial 5-blossom clusters counted on full trees. Fruit set is also presented as the cluster composition, which is an average of the number of fruits remaining in each cluster after fruit drop (excluding eliminated clusters).

On May 12, prior to treatment application and during the late tight cluster bud stage, the number of blossom clusters on each full tree was counted and multiplied by 5 potential fruitlets to represent the initial fruit load that would be monitored. The final fruit set, as the number of remaining fruitlets per cluster, was evaluated on full trees on July 22. Fruitlets were counted manually, and the data was recorded using the Perennia Orchard Tools application for iOS under the fruitlet counter function.

Trunk diameter was measured on July 22 at 10 cm above the graft union using a digital caliper on the north-south and east-west sides of the trunk and then averaged to calculate the trunk cross sectional area (TCSA) for each tree. The crop load was then expressed as the number of fruits per trunk cross sectional area.

Hand thinning efficiency

All trees under study were hand thinned by two individuals on the research team using an orchard ladder on each side of the row, implemented on Honeycrisp on July 22 and Gala on August 1. Hand thinning was done according to the commercial practice of allowing 10 cm between fruit and one fruit per cluster, and by removing small fruit. The research team practiced hand thinning on three trees outside of the treatment plot to define the process and increase efficiency prior to starting on treatment plots. Hand thinning was timed while thinning each treatment plot and fruit hand thinned from the plot was counted and recorded. The plots were hand thinned in plot order beginning in replication 1 and ending in replication 4.

Fruit quality

On the same day as commercial harvest on September 23, a subsample was harvested for determination of fruit quality. The subsample consisted of 10 representative marketable fruit that were gathered from the bottom, middle and top of the tree canopy. Fruit were held at room temperature and evaluations were completed for all Gala treatments on October 2 and Honeycrisp on October 3. Fruit samples were weighed to calculate average fruit size. The red blush colour coverage was estimated as a percent of the total fruit surface area using 5% intervals.

An average diameter was calculated for each fruit using a digital caliper across the equator of each fruit on the horizontal axis from perpendicular sides. The data was then rounded up to the nearest whole number and used to grade fruit into Honeycrisp and Gala size classes. The size classes were defined by the average of industry standards reported by Nova Scotia packers. Honeycrisp size classes were small culls (<63 mm), small (63-76 mm), ideal (77-85 mm), large (86-98 mm), and large culls (>98 mm). Gala size classes were small culls

(<60 mm), small (60-72 mm), ideal (73-86 mm), large (87-98 mm), and large culls (>98 mm). The percentage of fruit size distribution in each category was calculated for presentation of results.

Analysis

The analysis was completed using ARM2025.5. An ANOVA was run using Tukey's at $\alpha = 0.05$, for means comparison. The data analysis is attached in 'Appendix 4 – Data Result'. For the statistical analysis of return bloom on Honeycrisp, the means were log transformed to satisfy the normality assumption for parametric tests. Likely the biennial bearing nature of Honeycrisp affected the on/off status of individual treatment trees and influenced the normality distribution of the data. Analysis was performed on the transformed data but back-transformed values were presented for interpretation.

Tree carbohydrate balance and model interpretations of thinning conditions

The net carbohydrate balance and fruitlet thinning predictions according to the RIMpro model and fruitlet thinning predictions according to the BreviSmart model were observed live for the duration of the trial period. The models were run periodically and screenshots were taken prior to treatment application to compare predictions with observed conditions, thereby monitoring their reliability as predictive tools. Post-treatment observed conditions on RIMpro and BreviSmart were also recorded.

The performance of each thinning rate could then be compared to thinning severity recommended by the models based on nearness to the target crop load. Meanwhile, we noted any potential issues or limitations with the decision-support tool during our trial experience.

Results and Discussion

The growing degree day models indicated that at the start of the trial in early-June the base 5°C plant development degree days (starting March 1) were 10% and 16% above the five- and ten-year averages, respectively. The thinning season was earlier than average by about five days due to advanced fruitlet growth. Throughout the season, there was more variability than usual from the cycling of above- and below-average temperatures. The net effect of the cycling temperatures was near-average heat accumulation by harvest in late September. Weather during bloom was abnormally cold and cloudy that prolonged bloom, discouraged bee activity, and ultimately made pollination success questionable. However, one or two good days of pollination weather were enough to set a crop. Within clusters, Honeycrisp had a moderate density of strongly growing fruitlets and Gala had a high density.

Industry decisions for chemical thinning were challenging because of the uncertainty associated with pollination. Early decisions were to either thin as normal, to reduce rates, or to use Sevin alone. In general, reassessing later in the thinning window revealed the need for normal chemical thinning because fruit set was better than expected. Gala, in particular, was very difficult to thin.

Most notably, the Annapolis Valley of Nova Scotia was in an exceptional drought during the 2025 season. According to Kentville Environment Canada historical data, the precipitation from April to October over the growing season shows the year 2025 was the 7th driest growing season on record. However, the months of June to September during fruit growth represented the driest fruit growing period on record. The region received 65% of seasonal precipitation (417 mm/646 mm) and 18% of fruit period precipitation (68 mm/374 mm). The dry soil was expected to restrict fruit size across all trial treatments, but relative comparison of the treatments could still occur.

The air temperatures during thinning were hot during the day and cold at night, which challenged our interpretation of these conditions due to the opposing effects of hot and cold temperatures. In the end, the weather was unfavourable for natural fruit drop. However, the weather was conducive to thinning activity from the chemical products, which produced a sizeable fruit drop and resulted in near-target crop load. There was adequate fruit set and crop load within the trial area during the 2025 growing season to distinguish differences between the thinning treatments.

Trial 1: Honeycrisp

Return bloom

In the assessment on May 12 for return bloom as a floral bud percentage, only the Sevin + Fruitone at high rate [450 ml] applied in 2024 had significantly higher return bloom of 28.8% floral versus the untreated control of 2.1% floral. In general, the return bloom was related to the crop load in the previous year. Return bloom was very low where the crop density was high the previous year such as in the untreated control and Accede. Return bloom was moderate for the treatments of Sevin + Fruitone at low [300 ml] and standard rate [375 ml], Brevis, and Brevis + Fruitone. Following data transformation to meet statistical normality assumptions, Brevis was not improved by the addition of Fruitone at a low rate. Refer to 'Appendix 4 – Data Result, Table 7' for more detailed results.

Fruit set and crop load

On July 22 (48 days after Application A, 39 days after Application B), the fruit set on the Sevin + Fruitone treatments at the standard rate of Fruitone [375 ml] was 7.7%, which was significantly less than the untreated control at 19.4% and suggests thinning activity of the industry-standard treatment on Honeycrisp (Appendix 4 – Data Result, Table 9). Meanwhile, no differences were observed between the various rates of Sevin and Fruitone applied at low [263 ml], standard [375 ml], and high [488 ml] rates. The test product Brevis [2.3 L/ha] and Brevis + Fruitone [2.3 L/ha + 300 ml] had significantly less fruit set than the untreated control at 6.7% and 4.8%, respectively.

Expressing the results as crop load helps to reduce the variability of vigour among the test trees because crop load is a ratio of fruit to trunk diameter. In Nova Scotia, the ideal crop load for Honeycrisp is 6 fruit/cm^2 of TCSA to encourage annual bearing (Embree et al. 2007). In the context of this trial, the average tree diameter was 4.2 cm (13.9 cm^2 TCSA) and therefore the target fruit load was 83 fruit/tree. Crop load on the untreated control was 10.8 fruit/cm^2 or 150 fruit/tree, meaning that the crop load within the trial was above the commercial target on Honeycrisp and thinning was required (Figure 5).

The crop load of the Sevin + Fruitone low [263 ml], standard [375 ml], and high [488 ml] treatments was lower than the untreated by 62%, 57%, and 70% respectively (Figure 6). The differences between the rate adjustments were negligible.

The Brevis treatments had 77% to 79% lower crop load than the untreated control (Figure 5). The high label rate of Brevis was overly effective in the 2025 season. There was no benefit from the combination of Brevis with Fruitone in the current year of low final crop load, and thus no additive effect from the chemical thinner combination was observed. Refer to 'Appendix 4 – Data Result, Table 9' for more detailed results.

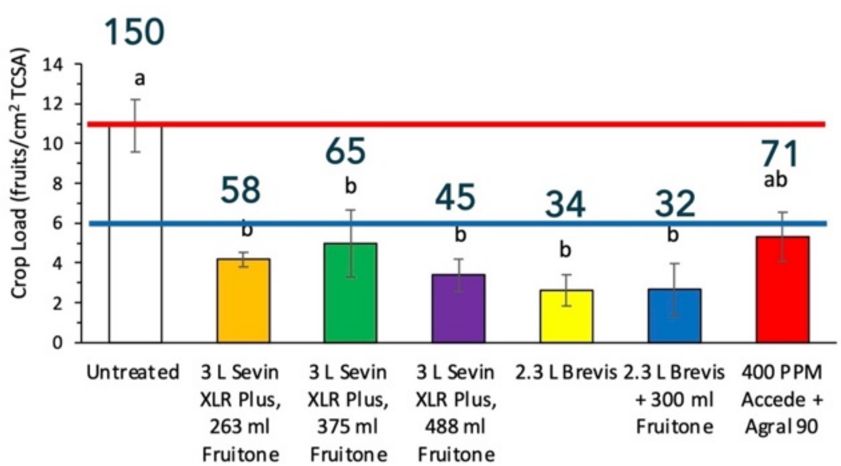


Figure 5. Crop load of Honeycrisp on EMLA.26 in Berwick, NS, after chemical thinning treatments and prior to hand thinning. Numbers above each treatment represent a conversion of the crop load to the number of fruit per tree for context, based on an average trunk diameter throughout the trial of 4.2 cm. The blue horizontal line is the target of 83 fruit/tree and the red horizontal line is the level of the untreated control. Sevin + Fruitone and Brevis treatments were applied at Application A when the average king fruitlet diameter was 8.5 mm on June 4. The Accede treatment was applied at Application B when the average king fruitlet diameter was 17.7 mm on June 13. Means with the same letter are not significantly different according to Tukey's test ($\propto$=0.05). N=4.

The natural fruit drop that occurred on untreated trees was inadequate, however, chemical thinners were aggressive on Honeycrisp and led to below-target crop loads. All chemical thinning treatments led to reductions in crop load to near or below the commercial target ranging from 2.3 to 5.1 fruit/cm^2. Even commercially low rates of the standard chemical thinner were too aggressive. Typically, chemical thinning should not target the final crop load because some additional detail work from hand thinning is best to reach the ideal fruit spacing.

The rescue thinning treatment with Accede at Application B when fruitlet size was 17.7 mm was not statistically significant but it trended toward lower crop load than the untreated control (Figure 5). The average fruitlet size of 15-25 is the rescue thinning stage when Accede is reported to have thinning activity, with the most activity expected from 15 to 20 mm. The current season’s weather was notably cold at night and may have been favourable for activity from Accede. During early season peach thinning, Accede has improved activity at cold temperatures (Racsko and Francescatto, 2026). In contrast, application of Accede for apple thinning during a heat wave was ineffective during the previous year in the current study. The relative humidity at around 75% at application might also have been conducive to uptake. However, many variables are involved, and it will take many years of use to learn all the complexities.

Figure 6. Representative plots showing the spatial distribution of crop load on Honeycrisp trees within each treatment on July 22, 2025 prior to hand thinning.

Hand thinning efficiency

At hand thinning on July 22, the time to hand thin the treatments Brevis alone and Brevis + Fruitone was significantly reduced by 57% to 58% compared to the untreated control, respectively (Appendix 4 – Data Result, Table 10). There were no statistical differences between the time to hand thin the untreated and the Sevin + Fruitone treatments and Accede. However, trends would suggest that the Sevin + Fruitone treatments took relatively less time than the untreated control by 41% to 49%.

Fruit quality

Average fruit weight did not differ between the treatments and the untreated control. The untreated and Accede trended toward the lowest fruit weight whereas the treatments Sevin + Fruitone, Brevis, and Brevis + Fruitone had a higher trending fruit weight (Appendix 4 – Data Result, Table 10). Red colour coverage was better for the Sevin + Fruitone at standard [375 ml] and high rates [488 ml] when compared with the untreated control.

Grading into size categories revealed a high proportion of small size fruit in the untreated control and Accede treatment. The Accede treatment used as a late thinner may not have influenced cell division as much as early thinner application. Accede was used alone in this study to determine its individual influence. However, in practice Accede is likely best used for fine tuning late in the thinning window and not as the primary thinner. Even though overthinning occurred for the Sevin + Fruitone treatments, a low crop load was a benefit to fruit size during the drought and ideal fruit sizes were achieved from the use of Sevin + Fruitone at the low, standard, and high rates (Figure 7) (Appendix 4 – Data Result, Table 10).

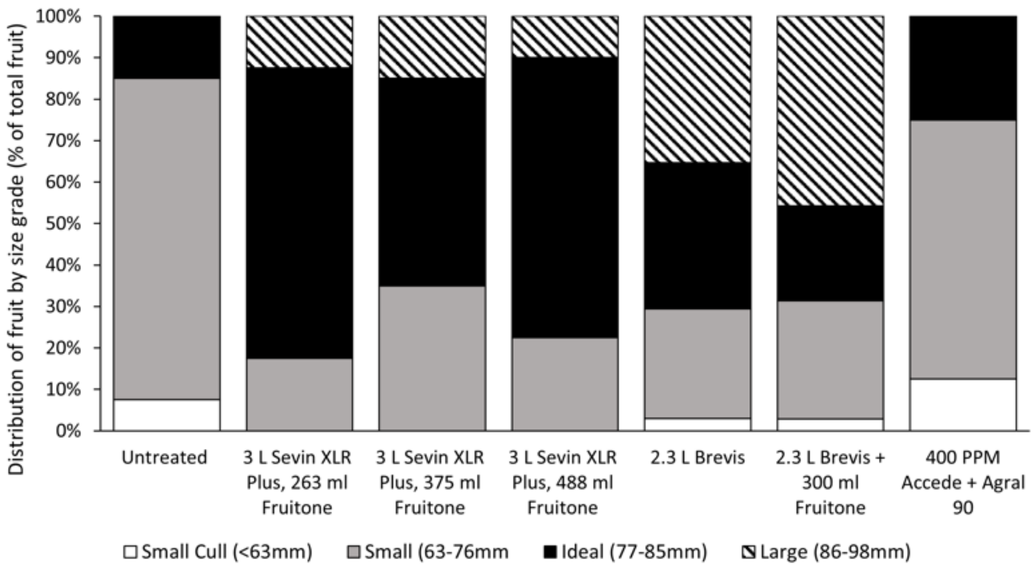


Figure 7. A 10-fruit sample of representative Honeycrisp per plot were graded into commercial grade distribution categories based on their average diameter taken on two sides. Size classes represent an approximate industry standard in Nova Scotia for small culls, small, ideal, and large fruit sizes. Sevin + Fruitone and Brevis treatments were applied when the average king fruitlet diameter was 8.5 mm on June 4, Accede was applied when the average king fruitlet diameter was 17.7 mm on June 13, and hand thinning was implemented on July 22. Fruit were harvested on September 23 and evaluated on October 3.

Trial 2: Gala

Return bloom

In the assessment on May 12 for return bloom as a floral bud percentage, no statistically significant differences were observed between the treatments. All gala trees had extremely high return bloom at 80.7% to 91.7%. There was a minor trend related to crop load the previous year among the treatments, however, the differences were inconsequential because there was enough total bloom. Refer to 'Appendix 4 – Data Result, Table 8' for more detailed results.

Fruit set and crop load

On July 22 (48 days after Application A), the fruit set was not significantly different between the treatments and the untreated control (Figure 8). The fruit set on the Sevin + Fruitone treatments applied at increasing rates of Fruitone [375 ml, 535 ml, 696 ml] was 11.5% to 13.2%, and therefore similar to the untreated control at 14.3% and suggests inadequate thinning activity of the industry-standard products on Gala in the 2025 season. No differences were observed between the various rates of Sevin and Fruitone applied at low [428 ml], standard [535 ml], and high [642 ml] rates.

In Nova Scotia, the ideal crop load for Gala is approximately 4-6 fruit/cm^2 of TCSA to ensure adequate fruit size in a cool production region like Nova Scotia (Bound 2023). In the context of this trial, the average tree diameter was 3.7 cm (10.8 cm^2 TCSA) and therefore the target fruit load was 43 to 65 fruit/tree. Crop load on the untreated control was 16.8 fruit/cm^2 or 183 fruit/tree, meaning that the crop load within the trial was far above the commercial target on Gala and thinning was required (Figure 8).

The crop load between treatments and the untreated control was not statistically different. The Sevin + Fruitone at low [375 ml], standard [535 ml], and high [696 ml] caused slight numerical reductions in crop load compared to the untreated by 27%, 10%, and 18%, respectively (Figure 8). Therefore, all chemical thinning treatments underthinned in the year of study. This year, chemical thinning Gala was less-than-optimal across the industry. The response to thinning might have been low due to a prolonged bloom in cool weather that led to variations in pollination timing. Flowers pollinated late or that opened late may have been unaffected by the early timing of chemical thinners at 6.8 mm average king fruitlet diameter. Similar to the response in Honeycrisp, the rate adjustments did not have commercial influence. Refer to 'Appendix 4 – Data Result, Table 11' for more detailed results.

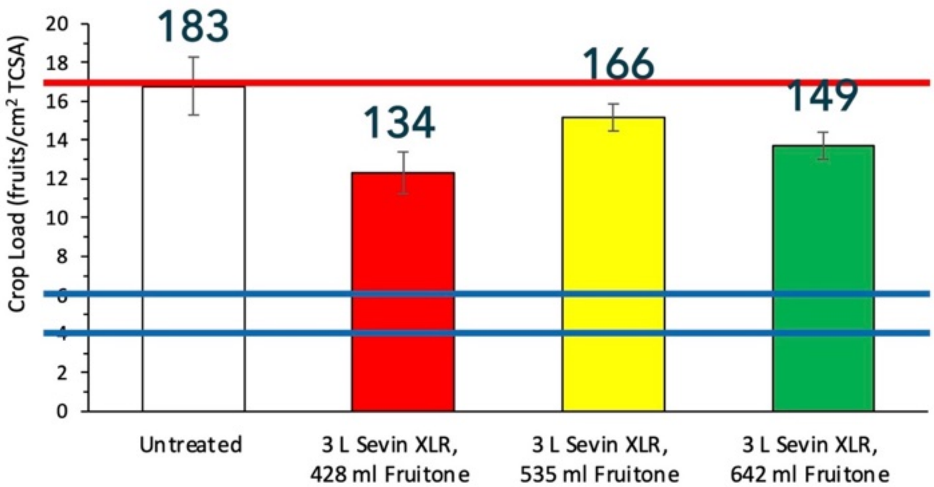


Figure 8. Crop load of Gala on G.41 in Berwick, NS, after chemical thinning treatments and prior to hand thinning. Sevin + Fruitone were applied at Application A when the average king fruitlet diameter was 6.8 mm on June 4. Numbers above each treatment represent a conversion of the crop load to the number of fruit per tree for context, based on an average trunk diameter throughout the trial of 3.7 cm. The blue horizontal line is the target of 43-65 fruit/tree and the red horizontal line is the level of the untreated control. Means are not significantly different according to Tukey's test (∝=0.05). N=4.

Figure 9. Representative plots showing the spatial distribution of crop load on Gala trees on July 22, 2025 prior to hand thinning.

Hand thinning efficiency

At hand thinning on August 1, the time to hand thin the treatment Sevin + Fruitone at the high rate [642 ml] was significantly reduced by 32% compared to the untreated control (Appendix 4 – Data Result, Table 12).

Fruit quality

Average fruit weight was not significantly different for any of the treatments (Appendix 4 – Data Result, Table 12). Red colour coverage was better for the Sevin + Fruitone high rate [642 ml] at 84.5% when compared with the untreated control at 66.8%. Grading into size categories did not reveal differences between the untreated control and the Sevin + Fruitone treatments (Appendix 4 – Data Result, Table 12)(Figure 10). A trend toward smaller fruit in the high rate of Fruitone [642 mL] might suggest damaging rates of Fruitone on Gala.

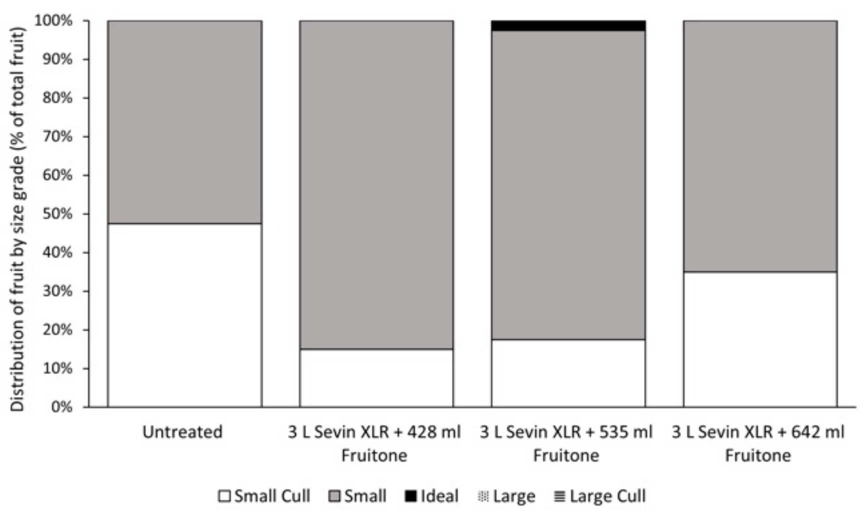


Figure 10. A 10-fruit sample of representative Gala per plot were graded into commercial grade distribution categories based on their average diameter taken on two sides. Size classes represent an approximate industry standard in Nova Scotia for small culls, small, and ideal fruit sizes. Treatments were applied when the average king fruitlet diameter was 6.8 mm on June 4 and hand thinning was implemented on August 1. Fruit were harvested on September 23 and evaluated on October 2.

Thinning Efficacy – Preliminary Conclusions for Honeycrisp and Gala

Under 2025 conditions:

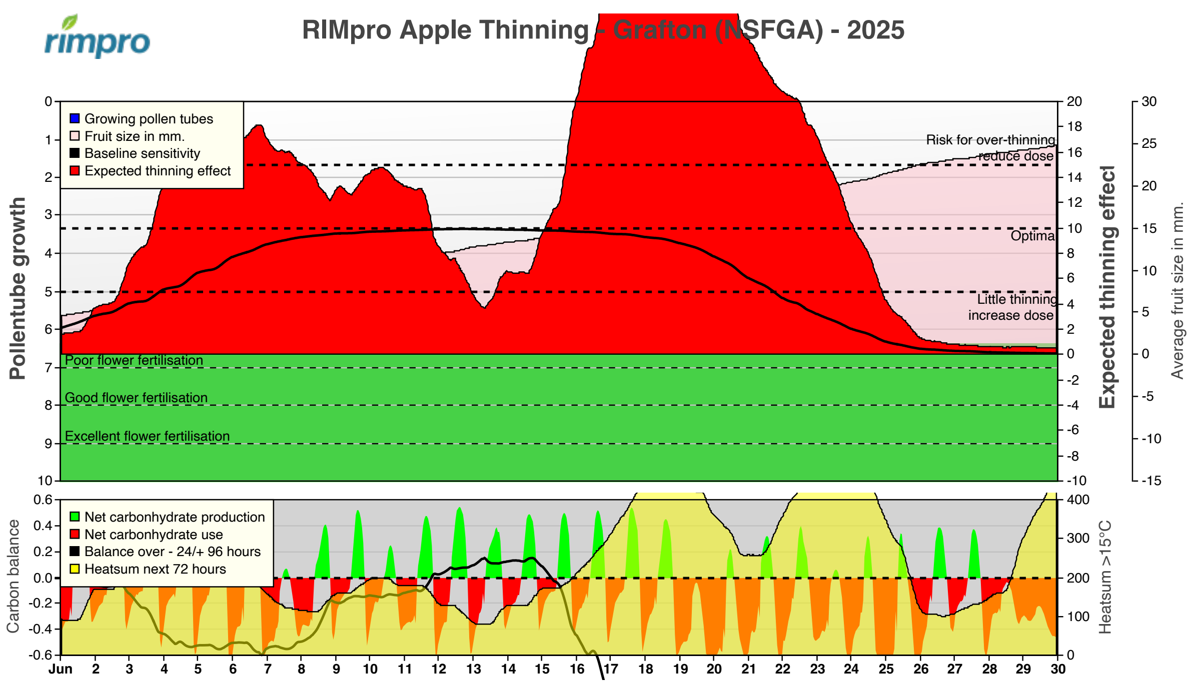
- **Return bloom –** Honeycrisp return bloom was directly related to crop load of the treatments in the previous year. Gala had a high return bloom regardless of the prior year.
- **Thinner response -** There was an excess of crop load on untreated trees and natural fruit set for Honeycrisp and Gala was similar to the previous year. However, in the current year there was a strong influence of chemical thinners on Honeycrisp and a weak influence on Gala. Fruitone rate adjustments of +/-30% in combination with Sevin had limited practical

influence this year. Generally, standard Fruitone rates (375 mL) performed well for Honeycrisp.

- **New Thinners** – The maximum rate of Brevis had a strong influence but no additive effect with Fruitone. Accede trended toward thinning when applied at 18 mm under 2025 weather conditions (nighttime <10C).
- **Fruit Quality** – Quality reflected the influence of crop load and drought. For Honeycrisp, fruit size was poor for the untreated and Accede alone. In Gala, poor thinning and drought resulted in small fruit sizes and trends might suggest caution using the highest rate of Fruitone at 642 mL.

Tree carbohydrate balance and model interpretations of thinning conditions

The RIMpro model considers the combined output of chemistry uptake and carbon balance. According to the RIMpro model, the thinning season throughout the month of June was described as a risk of overthinning from June 4 to 11, little thinning from June 12 to 15, and risk of overthinning from June 16 to 23 (Figure 11). Therefore, expected thinning conditions fluctuated throughout the month but not on a day-to-day basis.

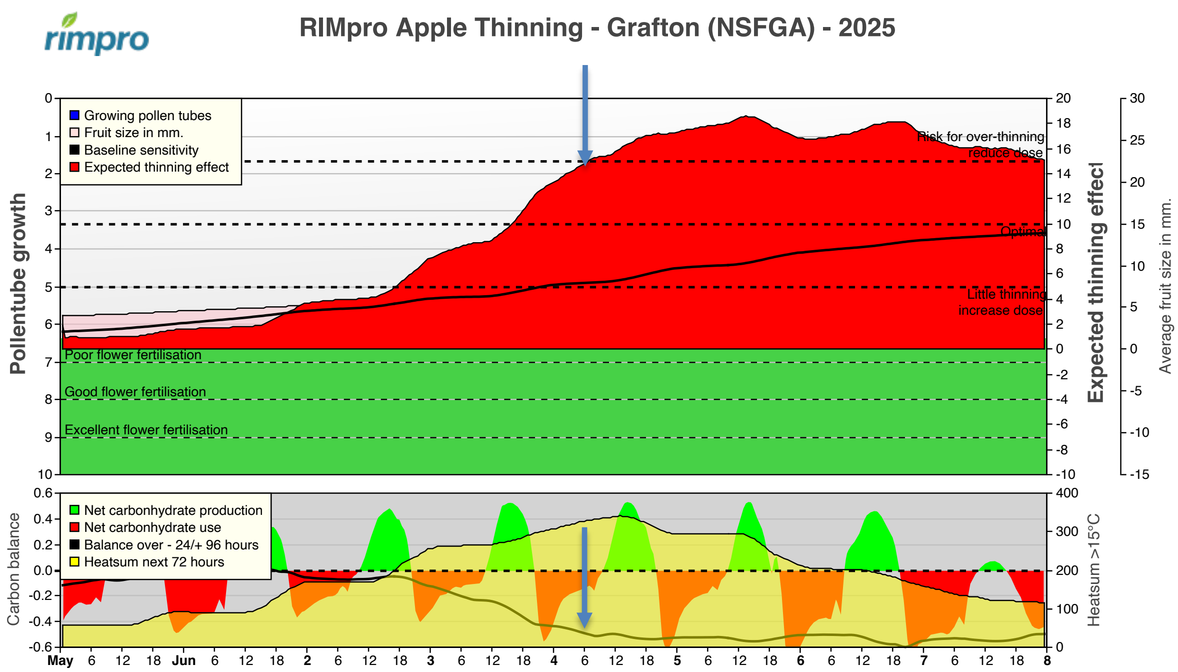


Note: The top of each graph shows the expected thinning effect (dark red, scale on right axis) with dotted line thresholds for little thinning, optimal, and risk for over-thinning. The fruit size in mm is modeled (light red, scale on far right) and influences the baseline sensitivity (black line) of fruitlets to thinning effect. The bottom of each graph shows the carbon balance (black line) by accounting for daily net carbohydrate production (green) and carbohydrate use (red) as influenced by weather factors.

Figure 11. The RIMpro apple thinning model output for the month of June 2025 using the Grafton (NSFGA) Davis Instruments on-farm weather station. The image shows the thinning model output that combines chemistry uptake

and carbon balance. Note that this model output was obtained after actual observed weather conditions and it represents the historical record during the 2025 thinning season.

The final recorded conditions in the RIMpro model for Application A on June 4 were a net carbohydrate deficit and an expected thinning effect of ‘risk for over-thinning, reduce dose’ (Figure 12). The model result corresponds with our field observations of easy thinning of Honeycrisp, even at low rates of chemical thinners. However, the model did not explain the low response of Gala to thinners.



Note: The top of each graph shows the expected thinning effect (dark red, scale on right axis) with dotted line thresholds for little thinning, optimal, and risk for over-thinning. The fruit size in mm is modeled (light red, scale on far right) and influences the baseline sensitivity (black line) of fruitlets to thinning effect. The bottom of each graph shows the carbon balance (black line) by accounting for daily net carbohydrate production (green) and carbohydrate use (red) as influenced by weather factors.

Figure 12. The RIMpro apple thinning model output for the period May 31 to June 8, 2025 using the Grafton (NSFGA) Davis Instruments on-farm weather station. The image shows the thinning model output that combines chemistry uptake and carbon balance. Chemical fruitlet thinners were applied during App A on June 4 (blue arrows) when the model described the thinning effect as a risk for over-thinning, the carbohydrate balance was in deficit, and the measured fruit diameter was 8.5 mm for Honeycrisp and 6.8 mm for Gala (whereas the estimated model diameter was 6.6 mm). Note that this model output was obtained after actual observed weather conditions and it represents the historical record.

However, models are used live in the season for decision-making so the predictive accuracy must also be considered by reviewing live predictions. At two days prior to application, the forecast thinning effect was below optimal with a carbohydrate surplus (Figure 13, A). On June 4 the day of application, the forecast thinning effect was optimal with only a slight carbohydrate surplus (Figure 13, B). After observed conditions occurred, the modeled thinning effect was a slight carbohydrate deficit and a risk for over-thinning. Therefore, the forecast predictions made two days in advance and on the day of application did not materialize.

The proprietary model likely accounts for the weather at 4 days following application (as is customary for the Cornell carbohydrate model). Ultimately, the model was unreliable for long-term predictions because it depended on the accuracy of forecasting. As with all models, the forecast likely reduces reliability of the model for planning purposes. In practice, the model predictions should be revisited constantly, and the most recent predictions are expected to be the most accurate.

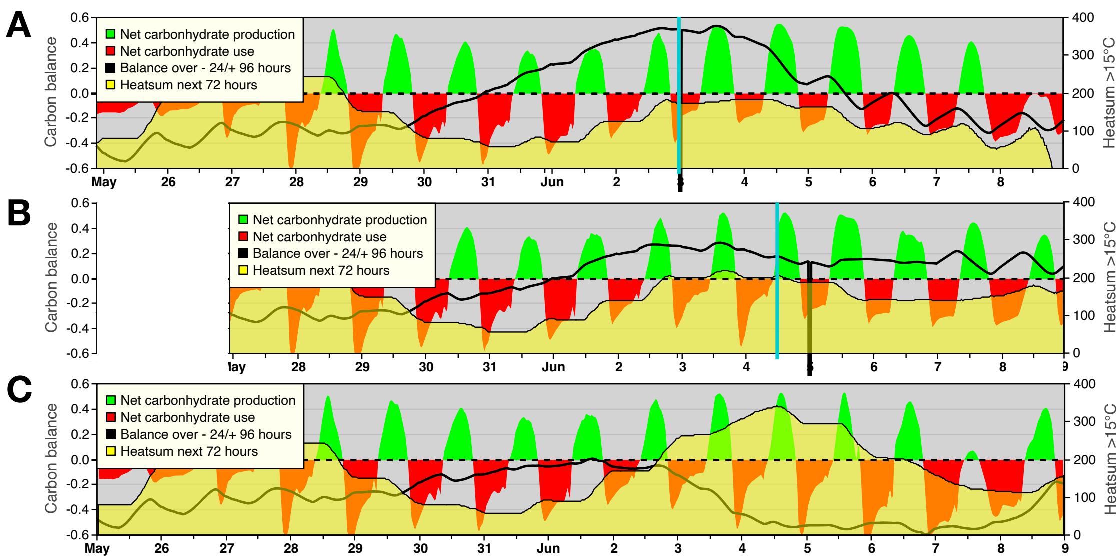


Figure 13. A comparison of the RIMpro carbon balance model outputs for forecast (A and B) and observed conditions (C) using graphs aligned by timescale over the period May 25 to June 9, 2025. Chemical fruitlet thinners were applied during App A on June 4. The teal vertical line in A) and B) indicates the time the model was calculated, after which all data is predicted and based on forecasted weather by the virtual weather service (Meteoblue). Observed weather data was recorded by the Grafton (NSFGA) Davis Instruments on-farm weather station. A) A forecast prediction captured on June 2 at 8:30 PM describing a carbohydrate surplus by application time. B) A forecast prediction on June 4 at 8:30 AM describing a minor carbohydrate surplus at application time. C) A final output showing the historical record based on actual observed weather conditions and describing a major carbohydrate deficit at application time.

The RIMpro model was monitored for predictions made before and after application to monitor its reliability as a predictive tool. The preliminary conclusions are summarized in Table 3. Based on the current year of study, the RIMpro model appears to be a good model for end of season interpretation but unique varietal responses may occur. Unfortunately, the model output is complicated and its use is not for everyone.

Table 3. Summary of preliminary conclusions from historical recorded and forecast predictions made by the RIMpro apple thinning model based on the 2025 season.

Calendar Date	Purpose of Model Reference	Thinning Prediction	Carbohydrate Balance	Accuracy of Thinning Prediction	Preliminary Conclusions
June 2, 2025	2-days prior to app – Planning ahead	↓ Little thinning	+0.4 surplus	X inaccurate	X Unreliable for long-term decisions
June 4, 2025	Day of application – Immediate decisions	--- Optimal	+0.2 surplus	X inaccurate	✓ Guidance for short-term decisions as accurate as forecasts
End of season	Seasonal Interpretation	↑ Risk for over-thinning	-0.5 deficit	✓ Matched field observations for Honeycrisp, not Gala	✓ Good model for seasonal interpretation (Gala response a rare or common exception?)

Accede's mode of action may be influenced by conditions other than carbohydrate status. Regardless, we will report the model results for carbohydrate status at the time of application in case they help discern the factors involved in efficacy of Accede. The final recorded conditions in the RIMpro model for Application B on June 13 for the single treatment of Accede were a net carbohydrate surplus and an expected thinning effect of 'little thinning, increase dose' (Figure 14). The maximum rate of Accede was used and resulted in near-target thinning activity.

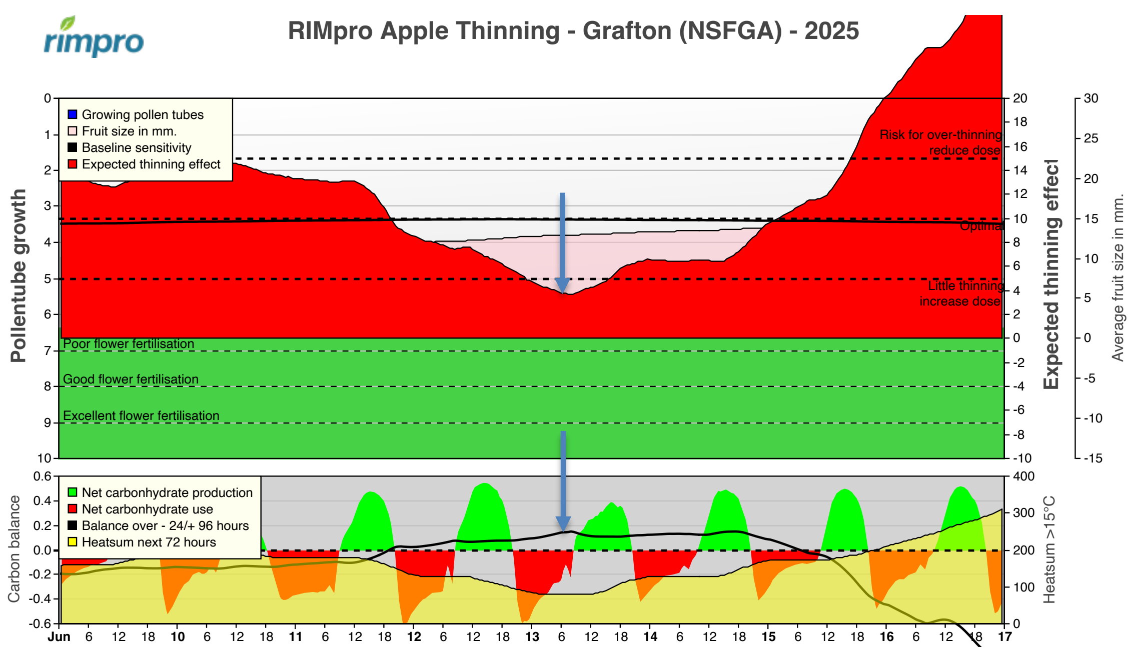
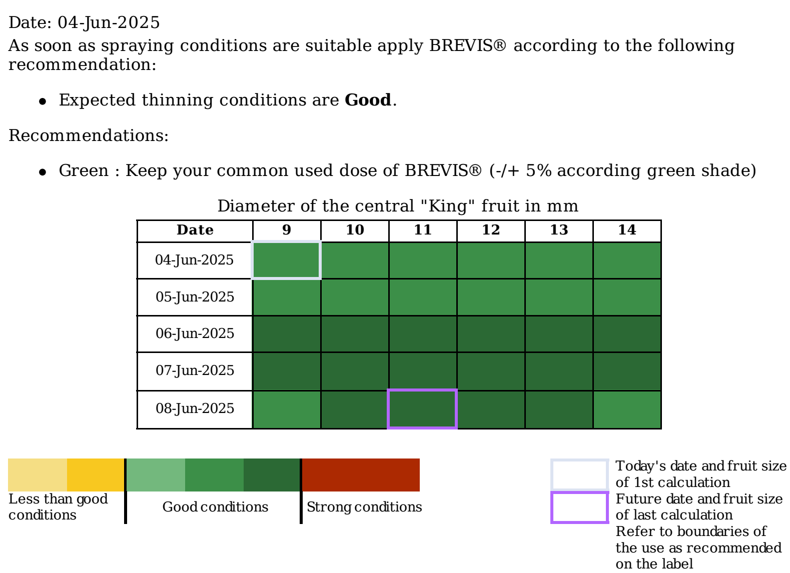


Figure 14. The RIMpro apple thinning model output for the period June 9 to June 17, 2025 using the Grafton (NSFGA) Davis Instruments on-farm weather station. The image shows the thinning model output that combines chemistry uptake and carbon balance. Chemical fruitlet thinners were applied during App B on June 13 (blue arrows) when the model described the thinning effect as little thinning, the carbohydrate balance was in surplus, and the measured fruit diameter was 17.7 mm for Honeycrisp (whereas the estimated model diameter was 13.0 mm). Note that this model output was obtained after actual observed weather conditions and it represents the historical record.

Brevis was applied on June 4 when BreviSmart recorded good conditions for thinning (Figure 15). The highest label rate of 2.3 L/ha was chosen to test the limits of the product even though Honeycrisp is considered moderate-to-thin in Nova Scotia. Before, during, and after thinning in the 2025 season, the expected thinning effect in BreviSmart was classified as good conditions. In the current study we observed overthinning with Brevis which may suggest that BreviSmart was correct in that the maximum label rate was not required. However, lower rates were not tested in this study and their comparative influence is unknown.

Currently, it is unclear why RIMpro predicted risk of overthinning whereas BreviSmart did not. Interestingly, the RIMpro model claims that a photosynthesis inhibitor like Brevis is largely affected by the carbohydrate balance following application rather than temperature. RIMpro predicted optimal thinning conditions when the carbon balance model was not combined with the chemistry uptake model.



Note: The table header represents the fruitlet size and the header column is the date of Brevis application. Where the date and fruit size intersect the model predicts whether thinning conditions are less than good, good, or strong.

Figure 15. The BreviSmart model output on June 4, the day of application, when the average Honeycrisp king fruitlet was 8.5 mm. BreviSmart predicted 'good conditions' being at the most ideal in mid-green colour. The

historical record agrees with what was forecast. Overall, good thinning conditions were predicted for Brevis by BreviSmart during the typical industry treatment window.

Model Predictive Accuracy – Preliminary Conclusions

- RIMpro is a complicated platform and will not be useful for everyone.
- RIMpro helped with seasonal interpretation, gave decent guidance on the day of application, but was unreliable for long-term predictions.
- The different behaviour of Honeycrisp and Gala was not predicted by the RIMpro model.
- The goal of using the model is to adjust thinner rates. However, so far we have not seen a practical benefit of adjusting the Fruitone rate by +/- 30%. Are greater adjustments required or multiple applications?
- Predictions were fairly steady from day to day but could fluctuate widely over a week.
- Conditions for predictions are not transparent, but a user might still find the interpretation of many complicated weather factors helpful.
- BreviSmart is simplified and may give useful guidance.

Conclusion

In conclusion, there was adequate natural fruit set and crop load on the Honeycrisp and Gala trees for the study year. We determined the effect of chemical thinning products, different timings, and concentrations on fruit thinning efficacy of apple in 2025. Overall, there was an excess of crop load on untreated trees. There was a strong influence of chemical thinners applied to Honeycrisp at 8.5 mm average king fruitlet diameter in the current study. There was a weak influence of chemical thinners applied to Gala at 6.8 mm average king fruitlet diameter in the current study.

Our preliminary observations in year 2 show that Fruitone rate adjustments of +/-30% in combination with Sevin had limited practical influence this year on Honeycrisp and Gala. Generally, Sevin + Fruitone treatments performed well for Honeycrisp [263 mL to 488 mL /1000 L water/ha] but underthinned on Gala [375 mL to 696 mL /1000 L water/ha] in the trial year. The maximum rate of Brevis [2.3 L/ha] had a strong influence under 2025 application conditions. Accede [400 ppm] trended toward thinning when applied at 18 mm under 2025 weather conditions that included cool nighttime lows of below 10C.

For the 2025 season we successfully compared crop load management models to work toward a goal to predict and improve thinning outcomes using chemical thinners. The RIMpro carbohydrate model explained heavy thinning outcomes on Honeycrisp but did not explain limited thinning on Gala. RIMpro gave reasonable short-term predictions but unreliable long-term predictions. BreviSmart was more user friendly and correct in that the maximum label rate was excessive during good thinning conditions.

The treatments will be repeated and the model predictions evaluated in the 2026 season under different weather conditions.

Funding and Acknowledgements

We are grateful for this opportunity in Nova Scotia to help inform crop load management efforts. We thank Jeffrey and Courtney Walsh of Walsh Farms for their incredible assistance and dedication with hosting the trial site. We would like to acknowledge the generous donation of treatment products by Adama and Valent Canada.

This project is generously funded through the Canadian Agri-Science 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, and industry contributors.

Appendix 1 – Experimental Design

Trial Map Treatment Description

Trt	Code	Description
1	CHK	Untreated Control
2		Sevin XLR 3 L/ha ; Fruitone Low 263 mL/ha
3		Sevin XLR 3 L/ha ; Fruitone Med 375 mL/ha
4		Sevin XLR 3 L/ha ; Fruitone High 488 mL/ha
5		Brevis 2.3 L/ha
6		Brevis 2.3 L/ha ; Fruitone Low 300 mL/ha
7		Accede 400 PPM ; Agral 90 0.05% V/V

Figure 16. Plot layout and treatment randomization for Honeycrisp in 2025.

Trial Map Treatment Description

Trt	Code	Description
1	CHK	1 Untreated Control
2		2 Sevin XLR;2 Fruitone Low
3		3 Sevin XLR;3 Fruitone Med
4		4 Sevin XLR;4 Fruitone High

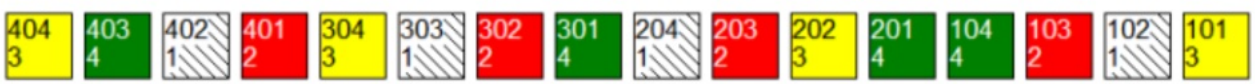


Figure 17. Plot layout and treatment randomization for Gala in 2025.

Table 4. Weather records for the month of June from the Grafton (NSFGA) Davis Instruments weather station referenced for the RIMpro model for Application A on June 4 and Application B on June 13.

JUNE 2025
LOCAL CLIMATOLOGICAL DATA
DAVIS INSTRUMENTS, WEATHERLINK NETWORK

Waterville, NS CAN
Grafton (NSFGA)

DAVIS

Lat: 45.0806 Long: -64.6726 Elev (ground): 22 m Time Zone: America/Halifax

	TEMPERATURE °C					DEG DAYS BASE 18.3°		PRECIP. (mm)	PRESSURE (mb)		WIND SPEED = km/h DIR = DEGREES							
														WIND MAX				
														INSTANT		ARCHIVE		
Date	MAXIMUM	MINIMUM	AVERAGE	AVERAGE DEW PT	AVERAGE WET BULB	HEATING	COOLING	WATER EQUIV	AVERAGE STATION	AVERAGE SEA LEVEL	RESULTANT SPEED	RES DIR	AVERAGE SPEED	SPEED	DIR	SPEED	DIR	Date
01	17.3	10.4	14.6	9.4	11.7	11.114	0.000	0.0	996.0	998.6	16.0	193	16.1	51.5	225	29.0	225	01
02	20.4	7.4	13.3	7.2	10.0	15.496	0.291	0.0	1009.1	1011.8	10.3	219	9.7	40.2	225	24.1	225	02
03	22.1	4.5	13.8	6.9	10.0	16.138	2.637	0.2	1016.7	1019.3	6.2	256	4.8	33.8	248	20.9	248	03
04	26.3	7.0	16.2	8.9	12.0	12.579	6.284	0.0	1018.9	1021.6	5.1	245	4.8	24.1	292	14.5	292	04
05	30.1	7.8	18.1	11.9	14.3	10.159	9.575	0.0	1013.4	1016.1	3.2	241	3.2	24.1	158	14.5	315	05
06	26.7	14.4	19.6	15.7	17.1	3.458	7.259	0.8	1010.8	1013.5	2.1	71	1.6	27.4	135	16.1	180	06
07	20.7	14.7	17.7	16.6	17.0	2.804	1.017	13.6	1007.3	1009.9	0.9	220	1.6	22.5	315	12.9	315	07
08	19.7	9.1	15.2	10.6	12.6	9.683	0.428	18.8	1007.3	1009.9	8.3	4	8.0	41.8	360	22.5	45	08
09	22.2	5.4	14.0	7.8	10.6	15.432	2.455	0.0	1017.2	1019.9	5.3	134	3.2	33.8	158	17.7	158	09
10	20.3	8.6	14.3	11.1	12.5	12.486	0.507	0.0	1014.2	1016.8	6.8	105	6.4	27.4	135	17.7	112	10
11	23.1	14.2	18.1	13.5	15.3	4.978	4.330	2.2	1007.8	1010.4	13.0	228	12.9	46.7	248	30.6	225	11
12	24.8	12.6	18.5	12.7	15.0	5.205	5.649	0.0	1006.0	1008.6	11.6	241	11.3	49.9	225	29.0	225	12
13	17.9	9.8	13.8	7.9	10.7	13.549	0.000	0.0	1013.6	1016.3	9.5	253	9.7	32.2	338	19.3	270	13
14	18.9	7.5	13.4	7.8	10.4	14.868	0.057	0.0	1020.1	1022.7	6.2	246	4.8	29.0	270	19.3	248	14
15	20.7	4.8	13.4	7.7	10.2	16.234	1.316	0.0	1019.9	1022.6	9.1	249	6.4	30.6	225	20.9	225	15
16	23.3	8.1	15.1	7.9	11.1	12.454	2.828	0.0	1019.9	1022.6	8.6	237	8.0	32.2	270	20.9	248	16
17	24.3	5.9	15.5	8.3	11.4	12.619	4.090	0.0	1019.0	1021.6	4.7	231	4.8	30.6	158	16.1	202	17
18	25.3	10.7	17.8	13.8	15.3	6.977	5.405	0.0	1014.3	1016.9	7.6	185	6.4	33.8	225	16.1	180	18
19	26.7	18.3	22.1	19.0	20.0	0.000	11.285	0.0	1007.6	1010.2	4.8	172	3.2	25.7	180	12.9	180	19
20	29.6	16.1	22.7	17.7	19.4	0.405	13.448	0.4	999.5	1002.1	14.9	203	12.9	64.4	158	32.2	202	20
21	24.2	15.1	19.3	12.6	15.2	2.820	5.780	0.0	1010.4	1013.0	15.6	238	16.1	53.1	248	30.6	225	21
22	24.9	9.1	16.9	12.2	14.1	7.230	2.836	5.2	1013.6	1016.2	4.9	195	4.8	45.1	158	20.9	158	22
23	23.6	15.8	18.9	15.8	16.9	2.819	4.406	0.0	1013.6	1016.3	2.5	345	1.6	20.9	338	12.9	338	23
24	32.7	15.2	24.5	19.6	21.1	2.000	20.488	0.0	1010.4	1013.1	10.8	231	8.0	40.2	225	24.1	248	24
25	29.4	17.2	24.2	16.0	18.9	0.101	17.567	0.0	1009.8	1012.4	5.9	280	8.0	30.6	225	19.3	248	25
26	19.3	9.6	15.1	6.2	10.5	9.823	0.107	0.0	1017.2	1019.8	3.9	285	4.8	24.1	22	16.1	315	26
27	23.6	8.3	16.1	7.8	11.5	10.626	4.074	0.0	1020.9	1023.6	4.0	285	4.8	25.7	292	16.1	315	27
28	16.3	12.1	13.5	10.8	12.0	14.361	0.000	6.6	1021.8	1024.4	2.3	122	3.2	35.4	158	11.3	225	28
29	19.1	12.8	16.1	14.1	14.9	6.818	0.081	4.2	1013.6	1016.2	6.0	111	4.8	32.2	180	12.9	112	29
30	25.6	16.2	19.9	16.6	17.7	1.835	6.466	0.0	1011.6	1014.2	5.7	261	4.8	24.1	225	12.9	248	30
	23.3	11.0	17.1	11.8	14.0	8.795	5.210		1012.7	1015.4	7.2	209	6.7	< Monthly Avg				

NUMBER OF DAYS WITH: >	Maximum Temp ≥ 32.2: 1 Maximum Temp ≤ 0: 0	Minimum Temp ≤ 0: 0 Minimum Temp ≤ -17.7: 0	Precipitation ≥ 0.2 mm: 8 Precipitation ≥ 2.0 mm: 5	Greatest 24 – hr precipitation: 27.0 Date: 7-8 Monthly Total Precipitation: 52.0

SEA LEVEL PRESSURE: >			DATE	TIME
	MAXIMUM:	1026.4	28	11:00
	MINIMUM:	992.9	1	00:45

DEGREEE DAYS: >		MONTHLY TOTAL	SEASON TO DATE TOTAL
	HEATING:	255.068	11101.328
	COOLING:	140.666	176.442

JUNE 2025
Waterville, NS CAN

Appendix 3 – Application Information

Table 5. Application conditions at the Honeycrisp block in Rockland during application A and B.

	A	B
Date	Jun-4-2025	Jun-13-2025
Start Time	7:15 AM	7:45 AM
Stop Time	8:30 AM	8:35 AM
Method	BROFOL	BROFOL
Placement	BROFOL	BROFOL
Mixed/Prepared By	Rachel Robbins	Rachel Robbins
Applied By	Maegan MacLean	Maegan MacLean
Entry Date	Mar-17-2026	Mar-17-2026
Air Temperature Start, Stop	9.1, 13.3 C	12.7, 13 C
% Relative Humidity Start, Stop	96, 82	75, 71
Wind Velocity+Dir. Start	2 KPH, SSW	6.4 KPH, NW
Wind Velocity+Dir. Stop	3.2 KPH, W	11.3 KPH, W
Wind Velocity+Dir. Max	11.3 KPH, WSW	32.2 KPH, W
Wet Leaves (Y/N)	Y, yes	Y, -
Soil Temperature	13.2 C	15.7 C
Soil Temperature Depth	15 cm	15 cm
% Cloud Cover	0	20

Table 6. Application conditions at the Gala block in Rockland during application A.

	A
Date	Jun-4-2025
Start Time	8:30 AM
Stop Time	9:15 AM
Method	BROFOL
Placement	BROFOL
Mixed/Prepared By	Rachel Robbins
Applied By	Maegan MacLean
Entry Date	Dec-29-2025
Air Temperature Start, Stop	13.3, 15.5 C
% Relative Humidity Start, Stop	82, 76
Wind Velocity+Dir. Start	2 KPH, SSW
Wind Velocity+Dir. Stop	3.2 KPH, W
Wind Velocity+Dir. Max	8 KPH, NW
Wet Leaves (Y/N)	Y, yes
Soil Temperature	13.2 C
Soil Temperature Depth	15 cm
% Cloud Cover	0

Appendix 4 – Data Result

Table 7. Statistical analysis and results of Honeycrisp return bloom in 2025 on treatment trees based on the 2024 treatment randomization and growing season.

Rating Date					May-12-2025
SE Description					% Fruiting Blossoms Return Bloom
Rating Type					FLOWER
Rating Unit					%
Rating Min/Max/Interval					0, 100, -
Sample Size					1 TREE
Number of Subsamples					1
Days After First/Last Appl.					340, 329
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	
1	Untreated Control				2.1b
					0.3StErr
2	Sevin XLR	3	L/ha	A	9.0ab
	Fruitone	300	mL/ha	A	0.1StErr
3	Sevin XLR	3	L/ha	A	11.7ab
	Fruitone	375	mL/ha	A	0.4StErr
4	Sevin XLR	3	L/ha	A	28.8a
	Fruitone	450	mL/ha	A	0.2StErr
5	Brevis	2.3	L/ha	A	12.5ab
					0.1StErr
6	Brevis	2.3	L/ha	A	11.6ab
	Fruitone	300	mL/ha	A	0.3StErr
7	Accede	400	PPM PR	B	2.7ab
	Agral 90	0.05	% V/V	B	0.2StErr
Tukey's HSD P=.05					25.37 - 26.54
Standard Deviation					0.41t
CV					42.12t
Grand Mean					0.98t
Levene's F^					0.686
Levene's Prob(F)					0.663
Rank X2					.
P(Rank X2)					.
Shapiro-Wilk^					0.9272
P(Shapiro-Wilk)^					0.0523
Skewness^					-0.4073
P(Skewness)^					0.3633
Kurtosis^					0.1813
P(Kurtosis)^					0.8343
Replicate F					4.806
Replicate Prob(F)					0.0125
Treatment F					2.755
Treatment Prob(F)					0.0444

ARM Action Codes

AL = Perform log transformation, LOG(x+1), on Summary Reports

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD).

t=Mean descriptions are reported in transformed data units, and are not de-transformed.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

^Calculated from residual.

d=Means are reported in de-transformed data units

Table 8. Statistical analysis and results of Gala return bloom in 2025 on treatment trees based on the 2024 treatment randomization and growing season.

Rating Date					May-12-2025
SE Description					% Fruiting Blossoms Return Bloom
Rating Type					FLOWER
Rating Unit					%
Rating Min/Max/Interval					0, 100, -
Sample Size					1 TREE
Number of Subsamples					1
ARM Action Codes					ER1
Data Entry Date					Mar-31-2026
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	
1	Untreated Check				80.7-14.6StErr
2	Sevin XLR	3	L/ha	A	89.7-2.9StErr
	Fruitone	428	mL/ha	A	
3	Sevin XLR	3	L/ha	A	82.3-7.7StErr
	Fruitone	535	mL/ha	A	
4	Sevin XLR	3	L/ha	A	91.7-2.3StErr
	Fruitone	642	mL/ha	A	
Tukey's HSD P=.05					32.01
Standard Deviation					11.32
CV					13.16
Grand Mean					86.08
Levene's F^					0.394
Levene's Prob(F)					0.761
Rank X2					.
P(Rank X2)					.
Shapiro-Wilk^					0.9505
P(Shapiro-Wilk)^					0.6447
Skewness^					-0.4313
P(Skewness)^					0.5125
Kurtosis^					-0.4483
P(Kurtosis)^					0.7229
Replicate F					0.472
Replicate Prob(F)					0.6449
Treatment F					0.682
Treatment Prob(F)					0.5948

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Excluded replicate 1 in column 24
^Calculated from residual.

Table 9. Statistical analysis and results of initial fruit load, final fruit load, fruit set %, trunk cross sectional area, crop load, and cluster composition for the Honeycrisp EMLA.26 trial before hand thinning in Rockland, NS.

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Initial Fruit Load		Post-trt Fruit Load		% Actual Fruit Set		TCSA		Crop Load		Cluster Composition	
Rating Date																
SE Description					Initial Fruit Load		Post-trt Fruit Load		% Actual Fruit Set		TCSA		Crop Load		Cluster Composition	
Part Rated					FLOCLU, C		FRUTOT, C		FRUSET, C				FRUTOT, C		CLUSTR, C	
Rating Type					COUNT		COUNT		PERCEN		AREA		COUNT		COUNT	
Rating Unit					NUMBER		NUMBER		%		cm2		NUMBER		NUMBER	
Sample Size					1 TREE		1 TREE		1 TREE		1 TREE		1 TREE		1 TREE	
Collection Basis					1 TREE		1 TREE		1 TREE		1 TRUNK		1 TREE		1 TREE	
Reporting Basis					1 PLOT		1 PLOT		1 PLOT		1 PLOT		1 PLOT		1 PLOT	
1	Untreated Control			A	851.3	-	145.3	a	19.37	a	13.557	-	10.80	a	1.4725368620	-
					177.2	StErr	6.9	StErr	0.58	StErr	0.042	StErr	0.19	StErr	0.1412435988	StErr
2	Sevin XLR	3	L/ha	A	532.5	-	60.8	b	12.13	abc	14.593	-	4.15	b	1.4254917625	-
	Fruitone	263	mL/ha	A	104.0	StErr	4.9	StErr	0.25	StErr	0.016	StErr	0.09	StErr	0.0996248739	StErr
3	Sevin XLR	3	L/ha	A	897.5	-	66.5	b	7.67	bc	13.275	-	4.65	b	1.5014865754	-
	Fruitone	375	mL/ha	A	207.2	StErr	22.4	StErr	0.40	StErr	0.011	StErr	0.34	StErr	0.0907374791	StErr
4	Sevin XLR	3	L/ha	A	742.5	-	60.0	b	8.50	abc	16.874	-	3.26	b	1.5440791017	-
	Fruitone	488	mL/ha	A	211.8	StErr	18.8	StErr	0.32	StErr	0.056	StErr	0.20	StErr	0.0560081365	StErr
5	Brevis	2.3	L/ha	A	706.3	-	37.5	b	6.71	bc	13.543	-	2.44	b	1.2489705236	-
					257.5	StErr	10.7	StErr	0.67	StErr	0.057	StErr	0.24	StErr	0.0969061858	StErr
6	Brevis	2.3	L/ha	A	895.0	-	38.3	b	4.80	c	12.907	-	2.27	b	1.2154080910	-
	Fruitone	300	mL/ha	A	222.3	StErr	21.7	StErr	0.83	StErr	0.031	StErr	0.35	StErr	0.1481476285	StErr
7	Accede	400	PPM PR	B	473.8	-	69.5	b	14.88	ab	13.029	-	5.12	ab	1.5905538841	-
	Agral 90	0.05	% V/V	B	79.8	StErr	16.0	StErr	0.41	StErr	0.026	StErr	0.25	StErr	0.1474975633	StErr
Tukey's HSD P=.05					686.65		65.36		9.679 - 11.517		6.0776 - 7.1645		4.671 - 6.020		0.43198408087	
Standard Deviation					293.86		27.97		0.671t		0.0772t		0.455t		0.18487573422	
CV					40.34		40.98		20.62t		6.58t		20.59t		12.94	
Grand Mean					728.39		68.25		3.254t		1.1737t		2.211t		1.42836097148	
Levene's F^					0.599		0.143		0.175		3.529*		0.336		0.719	
Levene's Prob(F)					0.728		0.988		0.981		0.014*		0.91		0.639	
Rank X2					.		.		.		.		.		.	
P(Rank X2)					.		.		.		.		.		.	
Shapiro-Wilk^					0.9821		0.9034*		0.8877*		0.9863		0.9674		0.9813	
P(Shapiro-Wilk)^					0.8969		0.0138*		0.006*		0.9649		0.5126		0.8794	
Skewness^					0.2431		1.1429*		0.8879		-0.2499		0.4152		0.025	
P(Skewness)^					0.5857		0.0151*		0.0539		0.5751		0.3542		0.9552	
Kurtosis^					0.1279		1.2522		-0.147		0.028		-0.1691		-0.5289	
P(Kurtosis)^					0.8827		0.1562		0.8653		0.9742		0.8453		0.5429	
Replicate F					5.678		3.036		11.412		0.803		2.562		5.041	
Replicate Prob(F)					0.0064		0.0560		0.0002		0.5082		0.0870		0.0104	
Treatment F					1.354		6.735		5.085		0.981		6.363		2.429	
Treatment Prob(F)					0.2854		0.0007		0.0033		0.4664		0.0010		0.0674	

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD). t=Mean descriptions are reported in transformed data units. Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.^Calculated from residual.

Table 10. Statistical analysis and results of hand thinning efficiency, fruit weight, fruit colour coverage, average fruit diameter, and grading distributions of small cull % (<63 mm), small fruit % (63-76 mm), ideal % (77-85 mm), and large % (86-98 mm) for the Honeycrisp EMLA.26 trial after hand thinning in Rockland, NS.

Rating Date												
SE Description					Time Thinning/ Tree		Average Fruit Weight (g)		Average % Red		Average Apple Diameter (mm)	
Part Rated					-, C				FRUIT, C		FRUIT, C	
Rating Type					TIME		WEIGHT		COLGRA		DIAMET	
Rating Unit					MIN		g		%		NUMBER	
Sample Size					1 TREE		10 FRUIT		10 FRUIT		10 FRUIT	
Collection Basis					- MINUTE		1 TREE		1 TREE		1 TREE	
Reporting Basis					1 PLOT		1 PLOT		1 PLOT		1 PLOT	
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code								
1	Untreated Control			A	2.12	a	169.77	ab	49.3	b	72.46	ab
					0.22	StErr	14.57	StErr	3.7	StErr	0.87	StErr
2	Sevin XLR	3	L/ha	A	1.16	ab	227.10	ab	59.3	ab	80.61	ab
	Fruitone	263	mL/ha	A	0.07	StErr	14.54	StErr	4.9	StErr	0.71	StErr
3	Sevin XLR	3	L/ha	A	1.24	ab	215.63	ab	68.8	a	78.89	ab
	Fruitone	375	mL/ha	A	0.40	StErr	24.64	StErr	3.4	StErr	1.10	StErr
4	Sevin XLR	3	L/ha	A	1.08	ab	225.86	ab	70.5	a	80.38	ab
	Fruitone	488	mL/ha	A	0.23	StErr	9.53	StErr	2.3	StErr	0.69	StErr
5	Brevis	2.3	L/ha	A	0.91	b	265.50	a	63.3	ab	83.40	a
					0.21	StErr	41.53	StErr	2.7	StErr	1.63	StErr
6	Brevis	2.3	L/ha	A	0.88	b	256.46	ab	59.3	ab	82.97	a
	Fruitone	300	mL/ha	A	0.37	StErr	33.91	StErr	3.2	StErr	1.57	StErr
7	Accede	400	PPM PR	B	1.34	ab	163.44	b	53.5	ab	70.67	b
	Agral 90	0.05	% V/V	B	0.24	StErr	23.35	StErr	7.6	StErr	1.06	StErr
Tukey's HSD P=.05					1.081		99.283		19.20		11.705	
Standard Deviation					0.463		42.490		8.22		5.009	
CV					37.14		19.52		13.58		6.38	
Grand Mean					1.246		217.680		60.54		78.481	
Levene's F^					0.207		1.475		1.532		0.847	
Levene's Prob(F)					0.971		0.235		0.216		0.549	
Rank X2					.		.		.		.	
P(Rank X2)					.		.		.		.	
Shapiro-Wilk^					0.866*		0.9799		0.9449		0.973	
P(Shapiro-Wilk)^					0.002*		0.8489		0.147		0.6623	
Skewness^					1.1358*		-0.0518		-0.0197		-0.3272	
P(Skewness)^					0.0157*		0.9073		0.9646		0.4641	
Kurtosis^					0.4113		-0.3912		1.1128		-0.2207	
P(Kurtosis)^					0.6357		0.6522		0.2058		0.799	
Replicate F					3.465		4.062		1.728		4.938	
Replicate Prob(F)					0.0381		0.0228		0.1971		0.0113	
Treatment F					3.281		3.393		3.497		3.983	
Treatment Prob(F)					0.0233		0.0204		0.0180		0.0104	

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
^Calculated from residual.

SE Description					% Fruit (Small Cull) 1		% Fruit (Small) 2		% Fruit (Ideal) 3		% Fruit (Large) 4	
Part Rated					FRUIT, C		FRUIT, C		FRUIT, C		FRUIT, C	
Rating Type					PERCEN		PERCEN		PERCEN		PERCEN	
Rating Unit					%		%		%		%	
Sample Size					10 FRUIT		10 FRUIT		10 FRUIT		10 FRUIT	
Collection Basis					1 TREE		1 TREE		1 TREE		1 TREE	
Reporting Basis					1 PLOT		1 PLOT		1 PLOT		1 PLOT	
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code							dAL	
1	Untreated Control			A	7.5	-	77.5	a	15.0	c	0.0	-
					2.5	StErr	11.1	StErr	9.6	StErr	0.0	StErr
2	Sevin XLR	3	L/ha	A	0.0	-	17.5	b	70.0	a	3.6	-
	Fruitone	263	mL/ha	A	0.0	StErr	14.4	StErr	12.9	StErr	0.4	StErr
3	Sevin XLR	3	L/ha	A	0.0	-	35.0	ab	50.0	abc	4.6	-
	Fruitone	375	mL/ha	A	0.0	StErr	21.8	StErr	17.3	StErr	0.4	StErr
4	Sevin XLR	3	L/ha	A	0.0	-	22.5	b	67.5	ab	6.1	-
	Fruitone	488	mL/ha	A	0.0	StErr	2.5	StErr	4.8	StErr	0.3	StErr
5	Brevis	2.3	L/ha	A	2.5	-	22.5	b	30.0	abc	6.6	-
					2.5	StErr	14.4	StErr	14.7	StErr	0.5	StErr
6	Brevis	2.3	L/ha	A	2.5	-	25.0	b	20.0	bc	16.7	-
	Fruitone	300	mL/ha	A	2.5	StErr	18.5	StErr	7.1	StErr	0.4	StErr
7	Accede	400	PPM PR	B	12.5	-	62.5	ab	25.0	abc	0.0	-
	Agral 90	0.05	% V/V	B	12.5	StErr	13.1	StErr	15.0	StErr	0.0	StErr
Tukey's HSD P=.05					23.37		46.80		49.11		16.99 - 116.05	
Standard Deviation					10.00		20.03		21.02		0.61t	
CV					280.0		53.41		53.01		96.81t	
Grand Mean					3.57		37.50		39.64		0.63t	
Levene's F^					0.653		1.328		1.539		0.406	
Levene's Prob(F)					0.688		0.289		0.214		0.866	
Rank X2					.		.		.		.	
P(Rank X2)					.		.		.		.	
Shapiro-Wilk^					0.8015*		0.9763		0.946		0.9485	
P(Shapiro-Wilk)^					0.0001*		0.7539		0.1569		0.1813	
Skewness^					2.1837*		-0.1866		-0.5108		-0.2584	
P(Skewness)^					0.0*		0.6752		0.2564		0.5623	
Kurtosis^					8.8963*		0.5538		-0.6589		-0.886	
P(Kurtosis)^					0.0*		0.5242		0.4494		0.3111	
Replicate F					1.000		9.267		3.717		3.586	
Replicate Prob(F)					0.4155		0.0006		0.0306		0.0343	
Treatment F					0.905		5.380		4.687		2.355	
Treatment Prob(F)					0.5131		0.0024		0.0049		0.0743	

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
^Calculated from residual.

Table 11. Statistical analysis and results of initial fruit load, final fruit load, fruit set %, trunk cross sectional area, crop load, and cluster composition for the Gala G.41 trial before hand thinning in Rockland, NS.

SE Description			Initial Fruit Load	Post-Trt Fruitset Total	% Actual Fruitset	TCSA (cm^2)	Post Trt Crop Load	Cluster Composition
Part Rated			FLOCLU, C	FRUTOT, C	FRUSET, C		FRUTOT, C	CLUSTR, C
Rating Type			COUNT	COUNT	PERCEN	AREA	COUNT	COUNT
Rating Unit			NUMBER	NUMBER	%	cm2	NUMBER	NUMBER
Sample Size			1 TREE	1 TREE	1 TREE	1 TREE	1 TREE	1 TREE
Collection Basis			1 TREE	1 TREE	1 TREE	1 TRUNK	1 TREE	1 TREE
Reporting Basis			1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Trt Treatment No.Name	Rate RateUnit	Appl Code						
1 Untreated Control			1247.5- 74.8StErr	178.5- 12.0StErr	14.31- 0.55StErr	10.728- 0.424StErr	16.77- 1.49StErr	1.498- 0.069StErr
2 Sevin XLR	3L/ha	A	1296.3-	155.5-	11.94-	12.668-	12.30-	1.420-
Fruitone	428mL/ha	A	59.3StErr	16.4StErr	0.96StErr	0.961StErr	1.07StErr	0.050StErr
3 Sevin XLR	3L/ha	A	1242.5-	165.3-	13.22-	10.930-	15.16-	1.508-
Fruitone	535mL/ha	A	58.4StErr	14.7StErr	0.55StErr	0.996StErr	0.68StErr	0.027StErr
4 Sevin XLR	3L/ha	A	1218.8-	136.8-	11.45-	10.045-	13.70-	1.515-
Fruitone	642mL/ha	A	88.5StErr	4.3StErr	1.15StErr	0.543StErr	0.68StErr	0.026StErr
Tukey's HSD P=.05			229.00	43.68	4.229	2.8186	4.339	0.1902
Standard Deviation			103.74	19.79	1.916	1.2768	1.966	0.0862
CV			8.29	12.45	15.05	11.51	13.57	5.8
Grand Mean			1251.25	159.00	12.732	11.0925	14.484	1.4850
Levene's F^			0.266	0.755	0.46	1.379	0.713	0.394
Levene's Prob(F)			0.849	0.541	0.715	0.296	0.563	0.76
Rank X2			.	.	.	.	.	.
P(Rank X2)			.	.	.	.	.	.
Shapiro-Wilk^			0.919	0.9345	0.935	0.932	0.9703	0.9642
P(Shapiro-Wilk)^			0.1626	0.2868	0.2926	0.2621	0.8435	0.7386
Skewness^			1.1761	0.8744	0.89	-0.5372	0.2635	-0.6807
P(Skewness)^			0.0547	0.1421	0.1356	0.3562	0.6473	0.2464
Kurtosis^			1.8979	0.7779	1.8071	-0.5346	-0.4227	0.9276
P(Kurtosis)^			0.1023	0.4867	0.1183	0.6312	0.7038	0.4085
Replicate F			4.567	3.611	0.110	2.863	1.447	1.700
Replicate Prob(F)			0.0330	0.0585	0.9523	0.0965	0.2927	0.2360
Treatment F			0.393	3.155	1.814	3.057	3.829	1.040
Treatment Prob(F)			0.7611	0.0789	0.2147	0.0843	0.0511	0.4208

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
^Calculated from residual.

Table 12. Statistical analysis and results of hand thinning efficiency, fruit weight, fruit colour coverage, average fruit diameter, and grading distributions of small cull % (<60 mm), small fruit % (60-72 mm), and ideal % (73-86 mm) for the Gala G.41 trial after hand thinning in Rockland, NS.

Rating Date									
SE Description				Time Thinning/ Tree	Average Fruit Weight (g)	Average % Red	Average Apple Diameter (mm)	% Fruit (Small Cull)	% Fruit (Small)
Part Rated				-, C		FRUIT, C	FRUIT, C	FRUIT, C	FRUIT, C
Rating Type				TIME	WEIGHT	COLGRA	DIAMET	PERCEN	PERCEN
Rating Unit				MIN	g	%	NUMBER	%	%
Sample Size				1 TREE	10 FRUIT	10 FRUIT	10 FRUIT	10 FRUIT	10 FRUIT
Collection Basis				- MINUTE	1 TREE	1 TREE	1 TREE	1 TREE	1 TREE
Reporting Basis				1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Trt No.	Treatment Name	Rate RateUnit	Appl Code						
1	Untreated Control			3.8583337191a	107.22-	66.8b	59.97-	47.5-	52.5-
				0.2361438123StErr	4.15StErr	7.8StErr	0.34StErr	14.4StErr	14.4StErr
2	Sevin XLR	3L/ha	A	2.8916669559ab	127.81-	70.8ab	63.63-	15.0-	85.0-
	Fruitone	428mL/ha	A	0.1821299069StErr	10.11StErr	4.2StErr	0.59StErr	9.6StErr	9.6StErr
3	Sevin XLR	3L/ha	A	3.5750003575ab	128.70-	65.3b	63.81-	17.5-	80.0-
	Fruitone	535mL/ha	A	0.2248971184StErr	6.13StErr	4.8StErr	0.57StErr	11.8StErr	12.2StErr
4	Sevin XLR	3L/ha	A	2.6208335953b	120.06-	84.5a	61.76-	35.0-	65.0-
	Fruitone	642mL/ha	A	0.1938134796StErr	13.55StErr	2.8StErr	0.77StErr	22.5StErr	22.5StErr
Tukey's HSD P=.05				0.98851055062	45.557	16.99	7.937	75.85	76.49
Standard Deviation				0.44778480144	20.637	7.70	3.595	34.36	34.65
CV				13.84	17.06	10.72	5.77	119.51	49.06
Grand Mean				3.23645865696	120.947	71.81	62.294	28.75	70.63
Levene's F^				0.704	1.107	0.094	1.481	0.503	0.351
Levene's Prob(F)				0.567	0.384	0.962	0.269	0.687	0.789
Rank X2				.	.	.	.	.	.
P(Rank X2)				.	.	.	.	.	.
Shapiro-Wilk^				0.9436	0.9496	0.9432	0.9489	0.9202	0.9142
P(Shapiro-Wilk)^				0.3948	0.4842	0.3902	0.4722	0.1701	0.1358
Skewness^				0.3365	-0.5501	0.6473	-0.5876	0.8972	-0.9178
P(Skewness)^				0.5599	0.3451	0.2693	0.3142	0.1327	0.1247
Kurtosis^				-1.077	1.1129	-0.2881	0.9619	0.1949	0.1824
P(Kurtosis)^				0.3391	0.3238	0.7953	0.3918	0.8606	0.8694
Replicate F				0.533	0.199	4.357	0.208	0.205	0.186
Replicate Prob(F)				0.6713	0.8947	0.0372	0.8883	0.8906	0.9035
Treatment F				6.644	0.928	5.196	1.007	0.798	0.727
Treatment Prob(F)				0.0117	0.4659	0.0235	0.4334	0.5256	0.5611

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
^Calculated from residual.

SE Description	% Fruit (Ideal)
Part Rated	FRUIT, C
Rating Type	PERCEN
Rating Unit	%
Sample Size	10 FRUIT
Collection Basis	1 TREE
Reporting Basis	1 PLOT

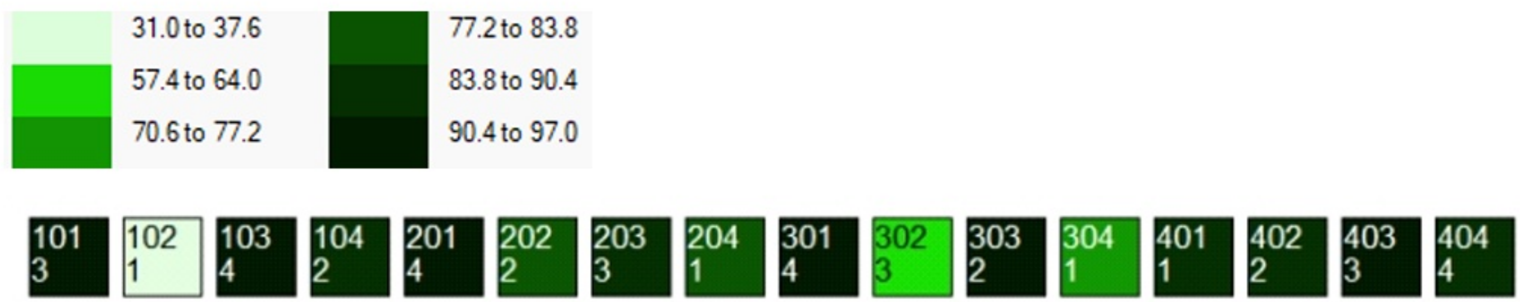
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	
1	Untreated Control				0.0-0.0StErr
2	Sevin XLR	3	L/ha	A	0.0-0.0StErr
	Fruitone	428	mL/ha	A	
3	Sevin XLR	3	L/ha	A	2.5-2.5StErr
	Fruitone	535	mL/ha	A	
4	Sevin XLR	3	L/ha	A	0.0-0.0StErr
	Fruitone	642	mL/ha	A	

Tukey's HSD P=.05	5.52
Standard Deviation	2.50
CV	400.0
Grand Mean	0.63
Levene's F^	0.333
Levene's Prob(F)	0.802
Rank X2	.
P(Rank X2)	.
Shapiro-Wilk^	0.7152*
P(Shapiro-Wilk)^	0.0002*
Skewness^	1.4754*
P(Skewness)^	0.0195*
Kurtosis^	3.9194*
P(Kurtosis)^	0.0027*
Replicate F	1.000
Replicate Prob(F)	0.4363
Treatment F	1.000
Treatment Prob(F)	0.4363

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
^Calculated from residual.

Figure 18. An assessment map representing the return bloom in 2025 of the Honeycrisp plots from the 2024 treatments.

Figure 19. An assessment map representing the return bloom in 2025 of the Gala plots from the 2024 treatments.



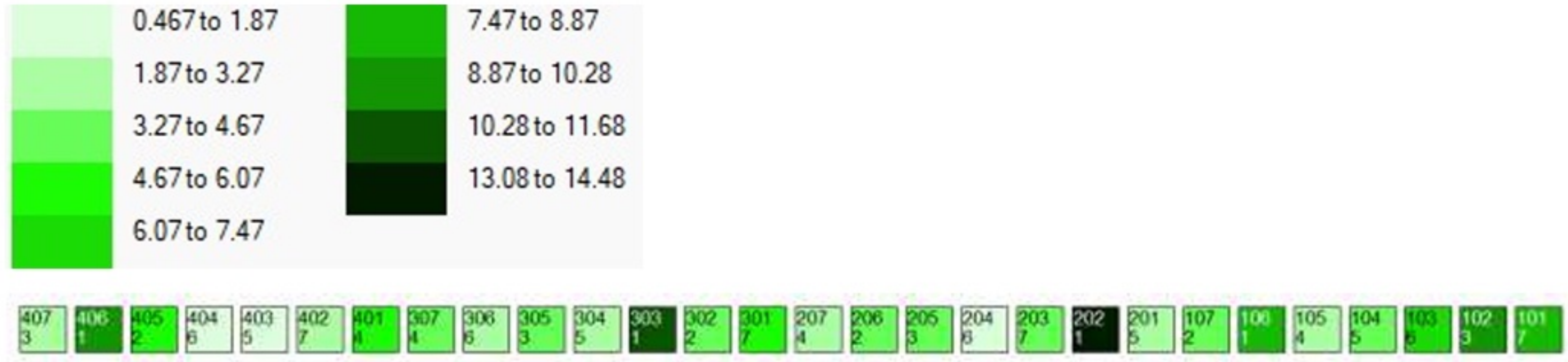


Figure 20. An assessment map representing the crop load of the Honeycrisp plots after chemical thinning treatments and prior to hand thinning.

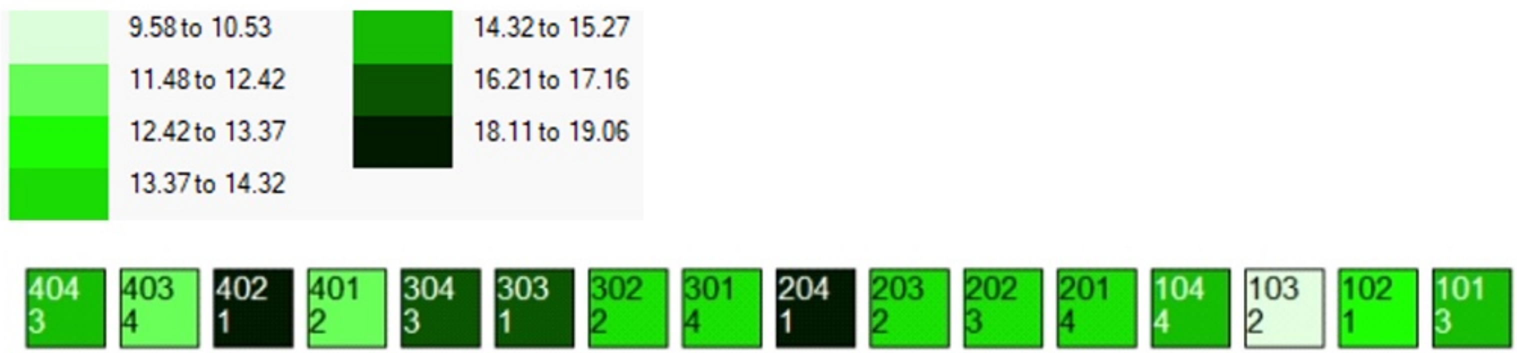


Figure 21. An assessment map representing the crop load of the Gala plots after chemical thinning treatments and prior to hand thinning.

Appendix 5 – References

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