

2024 Ontario, Canada Season Highlights –Apples

Person(s) Reporting:

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General Weather Conditions

Temperatures in the fall of 2023 were relatively average, whereas the winter was very mild. December averaged 2°C milder, with January and February of 2024 averaging 2 and 4 degrees, respectively, warmer compared to the 5- and 10-year averages (Figure 1).

The mild temperatures continued into the spring, pushing fruit staging ahead by 10 to 14 days, depending on the region. Several minor frost events, especially in the eastern part of the province, resulted in misshaped or russeted fruit by end of season but, overall, there were no significant losses. The early start of the season progressed throughout the year, where all fruit crops were harvested earlier than a 'normal' year.

Fall 2024 was generally drier compared to 5- and 10-year averages across the province. This was a welcome change due to the substantial summer rains throughout 2024. As shown in Figure 2, spring and summer rainfall of 2024 was quite irregular depending on the location, but most regions had a wetter summer than normal. Certain areas experienced flooding due to high rainfall over multiple days (London, Figure 3).

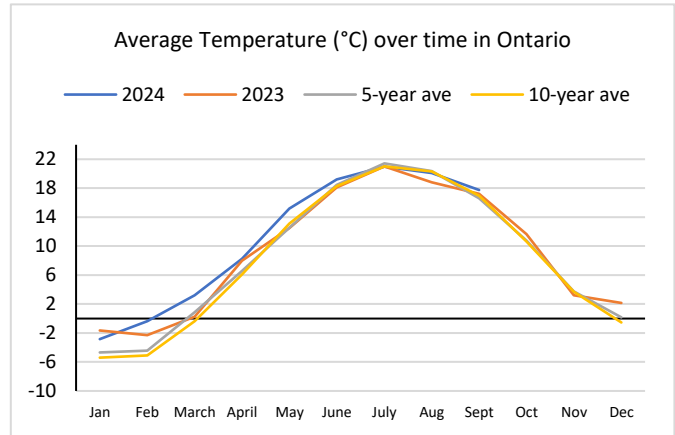


Figure 1. Average monthly temperatures (°C) of apple, tender fruit, and berry growing regions in Ontario over multiple years.

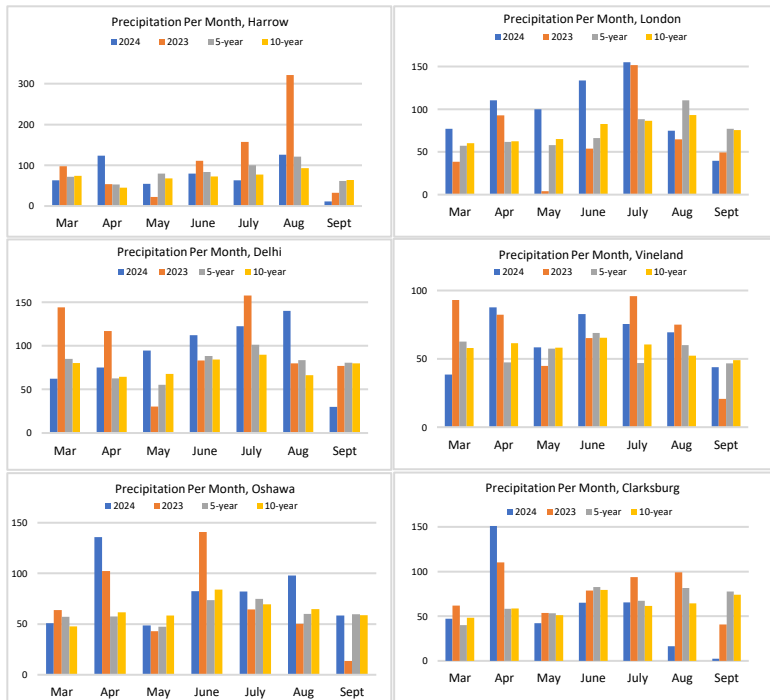


Figure 2. Monthly precipitation (mm) for key fruit-growing regions in Ontario (March – September 2024)



Figure 3. Severe flooding in orchard in Halton Region (photo provided by grower)

Horticulture Overview

Across the province bud break occurred roughly two weeks or 10 days early. The average bud break for McIntosh apples in Simcoe occurs at Julian Day 106 (April 16th), where in 2024 bud break occurred on Julian Day 93 (April 2nd). In 2022 and 2021, bud break occurred on Julian day 91 (April 1st) (Figure 4).

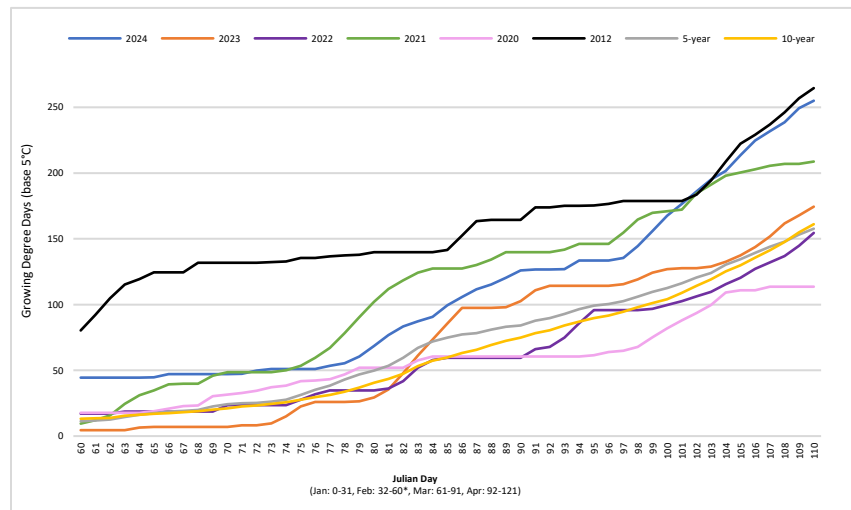


Figure 4. Heat accumulation at the Delhi Environment Canada weather station, as expressed as cumulative growing degree days (base 5°C) for the 2012, 2020 – 2024 growing seasons.

Thinning was a challenge this spring as apples did not want to chemically thin. Heavier crop load has been experienced in 2024, but sizing has not been affected. Sizing has shown to be larger than previous years, potentially attributed to an earlier season, regular rains, strong bloom, and warm weather.

Apples across the province had a good bloom, typical of a normal year except in orchards that had heavy bloom and crop in 2023. Mitigation of bitter pit was top of mind for growers due to 'Honeycrisp' size, but also among other varieties where bitter pit still devalues crop yields.

Skin finish issues arose in tree fruit late season, especially lenticel-related spotting or breakdown. Temperatures were hot enough to cause sunburn in July and August.

Apple maturity has been early by a week or so, with most of apple harvest already completed, other than late varieties. Colour has been of concern in the earlier harvests due to minimal cool temperatures with earlier harvest timings.

Pest Management Overview - Disease

With the recent changes to the Canadian **apple scab** toolbox (primarily loss or reduction of Group M fungicides), Ontario experienced a year we had been dreading. With a very mild winter followed by a warm, wet spring, scab quickly became an issue for many across the province. Growers were put to the test early with tank-mix or rotational options for their disease management strategies now that Group M fungicides are limited in use. For many, it was the first time they included Scala (pyrimethanil), Inspire Super (difenoconazole+cyrodinil), Luna Tranquility (fluopyram+pyrimethanil) and/or Syllit (dodine) early season in lieu of mancozeb. Many single site fungicides were applied solo throughout the season due to rains. Unexpected heavy rains also raised questions about residue wash-off, especially for mancozeb and whether an application even "counts" if it's potentially washed off in 24 hours. Those growers that could use captan or folpet during the summer had to reduce the use of oil which have many concerned about an increase in secondary pests, particularly scale and leafcurling midge. There was an uptake in the use of Buran (garlic extract) as a broad-spectrum alternative and/or burn out product which was quite effective for many growers.

Fire blight prediction maps were provided to Ontario growers again this year at <http://onfruit.ca/fire-blight-map/>. With the cooler weather extending bloom, most regions across the province saw secondary bloom well into June. According to the forecasting model, high to extreme infection potential occurred when later regions of the province were entering full bloom to petal fall. Overall, very little blossom and shoot blight was reported in the province this year. Rootstock fire blight continues to be an on-going issue each year for growers.

With high pressures of **powdery mildew** last year across the province as well as the mild winter, it did not surprise many to see mildew take hold in some blocks fairly early in the season during periods of dry weather. Those growers that relaxed spray intervals because of the low scab pressure soon found themselves chasing mildew.

Rust, particularly cedar apple rust has been observed in more regions of the province in recent years. Highest pressure remains in the eastern part of the province where there is significant acreage of Eastern red cedar. However, with the increase in ornamental junipers used in landscaping, orchards near residential areas are seeing infection where it hasn't been an issue before. With the restrictions on mancozeb, growers are concerned about control options.

Fruit rot (black rot, bitter rot) continue to be an increasing problem in apples in the province, mainly in Ambrosia, Gala, Empire, McIntosh, Honeycrisp and Golden Delicious. Hot, humid weather followed by thunderstorms in the late summer made for ideal infection conditions for bitter rot. Heavy rains frequently removed residue. Growers are concerned about the potential loss from fruit rot coming out of storage as a similar situation occurred in 2018/2019.

Tree decline continues to be an issue in the province. Typically Gala/M9 between the ages of 5-12 years appear most susceptible with this issue. In Ontario, **phomopsis (Diaporthe) canker** at the graft union is still very common with decline cases. Fire blight issues are also confounding this. Sudden tree collapse has also been observed in tender fruit and hazelnut.

Since the onset of tree decline issues in the province, virus detection in apples has increased. Most common detections include **apple chlorotic leaf spot virus**, **apple stem pitting virus** and **apple mosaic virus**. Virus has only been detected in M9 rootstock; it has not been detected in alternative rootstock. Ambrosia is the primary cultivar affected.

Various unexplained skin finish issues on Ambrosia have been observed over recent years. In particular, brown spotting similar to bacterial spot and discoloured dimpled areas around the calyx end of the fruit.



Marssonina blotch was confirmed on Gala and Empire in Ontario in 2021. Leaf symptoms continue to be observed in the same orchard blocks as well as new orchard confirmations each year. Issues tend to be common in blocks where late season fungicide applications exceed 3 weeks, likely resulting in little to no residue. Late season **Alternaria blotch** has also become more commonly observed in the province beginning late August into September. Typically Gala are the most commonly affected cultivar.

MAIN ISSUE/CONCERN

The horticulture industry has been hit hard with the recent re-evaluation decisions for a significant number of key protection materials including numerous Group M fungicides, leaving apple growers with very little resistance management strategies remaining.

- In 2021, **thiram, ziram, ferbam and metiram** were cancelled.
- Significant use restrictions have been put in place for **captan** and **mancozeb**:
 - Captan - maximum of 2 applications for any apple orchard with a canopy width >2m (maximum 10 applications for width <2m), restricted entry interval of 24 days for hand thinning and a preharvest interval of 19 days.
 - Mancozeb – maximum of 4 applications, restricted entry of 35 days for hand thinning and a preharvest interval of 77 days (previously 45 days).

Pest Management Overview - Insects

Rosy apple and green apple aphid levels were higher than average late season but most broad-spectrum insecticides managed populations. Woolly apple aphid continues to become an increasing pest of concern in many orchards. Few registered aphicides with the exception of Movento (spirotetramat) and Closer (sulfoxaflor) provide effective control of woolly at labelled rates. Growers also struggle with determining an appropriate spray timing, often waiting until colonies are obvious in outer canopy before implementing control.

Potato leafhopper continues to be seen earlier and in higher numbers over recent years. Many tree fruit blocks are now actively managing leafhopper with multiple applications yearly, especially in young orchards.

With the consistent rains, motile stages of **European red mite** and **two-spotted spider mite** were quite low. However, the blast of warm weather late August caused bronzing in some blocks. **Blister mite** levels have been increasing in pear orchards that have a history of this pest. In-season control sprays appear to have a suppression effect but have failed to provide full control.

Increasing scale problems such as **San Jose scale**, **oystershell scale** and **lecanium scale** continue to be identified in tree fruit. Loss of broad-spectrum products in last decade and fewer growers using dormant oil are likely contributing to this. Movento (spirotetramat) tends to be the strongest summer insecticide; however, timing for scale control is often 2-3 weeks later than effective timing for leafcurling midge. Some growers have looked at using Sivanto Prime (flupyradifurone) or Closer (sulfoxaflor) at pink.

Plum curculio activity had an early start but extended activity. Despite the longer activity, overall, low levels of plum curculio damage have been found.

Mullein bug activity increased quickly over the extended bloom period which had some growers concerned, especially those that experienced delays removing honeybees. Fruit damage was reported in several regions. Product of choice is often Calypso (thiacloprid) which is no longer available in Canada..

Overall, lepidopteran pests, such as **codling moth**, **oriental fruit moth** and **obliquebanded leafroller** saw flights chug along all season without significant peaks in activity. Low damage was reported.

European apple sawfly continues to spread across the province, with established populations in eastern Ontario, Georgian Bay region and Toronto/Hamilton region. Sporadic damage has been observed in other regions such as Niagara, Norfolk and London indicating range expansion of this invasive species into southwestern Ontario. Loss of Calypso (thiacloprid) limits options for pink or petal fall management. Altacor (chlorantraniliprole) or Delegate (spinetoram) are alternative options typically used.

Provincial surveys of **spongy moth** saw a record-breaking area of defoliation of almost 1.8 million hectares in 2021 and again in 2022. Since then, pressure has been decreasing each year though orchards within hot spot regions continue to see significant damage to blossoms, foliage and developing fruitlets.

With the frequent summer rains, **apple maggot** activity remained high in many regions throughout late season. Damage was reported in these blocks. Recent label changes to Imidan (phosmet) limit the use until after hand thinning. In those blocks that were able, border sprays were applied.

Apple leafcurling midge populations continue to build in regions across the province. Trap catch numbers rose very quickly this year once temperatures were above 7°C and remained high well into the fall. In established orchards, infestations of up to 60-75% of shoots have been observed and some growers believe this pest is affecting yield. Mullein bug and Orius continue to be significant predators of leafcurling midge larvae throughout the season. Regional degree day models have been developed for Canada and validated in Ontario. Currently, growers are timing sprays for 50% adult emergence. Some regions of the province have reintroduced prebloom pyrethroids to manage first generation activity.

Pests of increasing concern in the province include **stink bug** and **Japanese beetle**. With consecutive years with drought conditions, damage caused by green and brown stink bug has been observed in July. It has already been noted by some storage facilities that stink bug damage is obvious on fruit coming in. Japanese beetle is now widespread across the province and can cause extensive damage to Honeycrisp.

Ambrosia beetle including black stem borer and granulate ambrosia beetle remain sporadic in young orchards, but can cause significant tree death in blocks where populations are established. Recent provincial surveys have identified another species of concern, *Anisandrus maiche*.

MAIN ISSUE/CONCERN

Similar to fungicides, on-going re-evaluation decisions for some of the more broad-spectrum insecticides available to fruit grower are having a significant impact on pest management programs. Of greatest concern is the limitations of phosmet to late season apple maggot control only and the cancellation of neonicotinoid products such as chlothianidin and thiamethoxam. Through voluntary cancellation, thiacloprid is the latest product to be lost to apple growers as of December 2024. This will have significant impact on petal fall management for mullein bug, plum curculio, internal lepidopterans and aphids in apples.