Cornell University
Cooperative Extension

Lake Ontario Fruit Program
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"*Fruit Facts*" – Friday, May 10th, 2024

Mario Miranda Sazo, Janet van Zoeren and Anya Osatuke

Don't Forget to Attend Next Monday
WNY and Capital Region Virtual Petal Fall Thinning Meeting

Monday, May 13, 4:00 PM

Sponsored by CCE-ENYCHP & CCE-LOF

- Welcome & Intros
- Mike Basedow (CCE-ENYCHP) - Phenology Updates in the Saratoga area
- Craig Kahlke & Mario Miranda Sazo (CCE-LOF), Phenology Updates in Western NY
- Jim Eve (consultant, Eve Farm Service, LLC) & Vaughn Gingerich (consultant, Lake Ontario AG Consulting, LLC), Phenology Updates in Wayne County, NY
- Dr. Terence Robinson, Cornell, Thinning Recommendations at the Petal Fall Timing for both regions

Join Zoom Meeting (no preregistration needed):
https://cornell.zoom.us/j/98572569175?pwd=Y1hUdDUyTHdMS2hHbXQvcmxRR2hyZz09

Meeting ID: 985 7256 9175, Passcode: 171971

To Do Today

- **Think differently, act accordingly, and learn from your own mistakes in the past:** You may have forgotten what you did or didn't do and the consequences you paid by not doing the important things and at the right time last year.
  - As a professional WNY orchardist, you should visit your blocks and check if pollination already occurred at your site today Friday morning/at some point today but not later than tomorrow Saturday.
  - By now you should also have a good and objective idea if your blocks were affected or not by the cold events of April 25-26. Did you evaluate and hand drawn the cold damage distribution maps that I suggested you in the last several Fruit Facts?
  - The role of a WNY commercial fruit grower is understand and effectively manage one of the most complicated but critical tasks like chemical fruit thinning after pollination and early fruit set occurred. If you are not aware, pollination already occurred for several blocks/cultivars by the end of the day yesterday!
  - Last year we made (as a whole WNY industry) a big mistake by leaving too many blocks unthinned (scared after the infamous late frost of May 18, 2023).
  - If you can't recall, several growers spent a large amount of money and valuable time during hand thinning. It was a long and complicated nightmare that some growers experienced for several weeks. The hand thinning job in the LOF region was enormous because we did not thin early enough (as stated earlier) and because when growers tried to thin the 2023 crop with a multitude of frost damage levels later, the thinning response was very poor at the end, and we ended up with a big and expensive hand thinning job.
  - Fortunately, last year we were able to grow the fruit in those mid-, half-, or full frosted clusters left on the trees just because we had several rain events during the 2023 growing season.
  - In summary, we were very lucky in 2023 as a whole industry and had a relatively good 2023 crop.

- **What could potentially happen if you don't thin aggressively this 2024 thinning season, had good/strong pollination/initial good fruit set by the end of this week/weekend, but later you experience a very poor/cold weather not very conducive to good thinning? And to make things more complicated, you suffer a devastating long drought in the middle of fruit cell expansion, and you don't have access to irrigation this summer?**
  - This year many of you can't make the same mistake than last year. No excuses!
  - Please recall what we discussed during the last day of our 2nd WNY annual fruit conference in Rochester in February 9, 2024:
    - Undersized and overcropped trees are worth nothing these days with the current economy.
    - Chemical thinning (starting soon at petal fall and especially if you didn't bloom with an excessive amount of flower clusters) will be critical/very important!
    - We are looking for a big US crop again, and fruit quality will be more important than ever!

Suggested chemical thinning approach for Honeycrisp and Gala (a more complete set of recommendations will be discussed during the petal fall thinning meeting next Monday by Dr. Terence Robinson, see above the meeting announcement):

Suggested Chemical Thinning for Honeycrisp: Be ready to spray petal fall sprays to mature 'Honeycrisp' trees and specially if you did not chemically blossom them this past weekend (ATS, some NAA) or during the early part of this week (mainly conducted on Monday or Tuesday with NAA). Chemical thinning of 'Honeycrisp' is essential to achieve both annual cropping and the desired fruit quality of this variety in 2024. To successfully control biennial bearing, Honeycrisp needs very early thinning at bloom (window already closed) and petal fall (spray window will start opening pretty soon in early sites, get ready!).

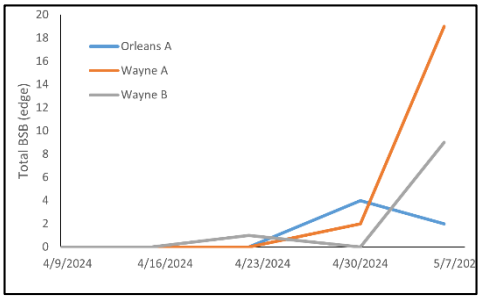
- **Petal Fall (fruits at 5-6mm)**
  - **NAA 4oz/acre + Sevin (1pt/acre)**
- Fruits at 11-13 mm
  - NAA 3oz/acre + Sevin(1pt/acre)
- Fruits at 15-20 mm (if needed)
  - NAA 4oz/acre+ Regulaid (1pt/acre)
  - Accede+Maxcel

Suggested Chemical Thinning for Gala:

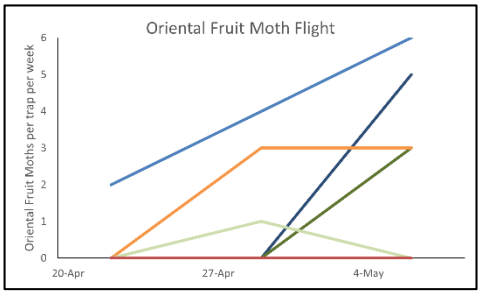
- **Petal Fall (fruits at 5-6mm)**
  - **NAA 4oz/acre + Sevin (1pt/acre)**
  - **Macel 128oz/acre+Accede 400ppm**
- Fruits at 11-13 mm
  - Maxcel 128oz/acre + Sevin(1pt/acre)
- Fruits at 15-20 mm (if needed)
  - Accede+Maxcel

- **Ongoing apple scab infection event!** Depending on your location, you are likely continuing to be in the middle of an apple scab infection event. Check your weather and/or NEWA models for more precise information, but in general it seems that west of Rochester is just coming out of a major infection, while east of the city is just heading into one. It seems like we've had nothing but weather conducive to apple scab, but despite that I have not yet seen a single scab infection. Regardless, we are still in primary infection season. This would be a good time to begin to scout for early scab infections on your farm.
- **Fire blight** infection risk remains low.

- **Black stem borer** numbers are increasing but still quite low (see graph at right).



- **Oriental fruit moths** are flying. We have an ~April 30h biofix date across most of the region (see graph at right – orange line is a trap set in a peach block). For now, we are at ~120 degree days across the region (out of 350 to time larvicide application). Note that last year we were trapping upwards of 60 per trap per week in several locations, and yet by far the majority of "worms" in the apples at the end of season were codling moth rather than OFM. Which is to say, it may be more important, for most farms, to time insecticide applications based on PC materials at petal fall and CM phenology for the lep heavy hitters. However, if you have a suspicion of high OFM worms in apples last year, and would like me to visit this fall to look at some fruit, give me a call.



- Consider pesticide choices carefully while **bee hives** are in the orchard. For a reminder of which products are most bee-safe, and what products are worse when used together, view our "Bloom Pesticides – Relative Toxicity to Pollinators" cheat sheet at https://rvpadmin.cce.cornell.edu/uploads/doc_870.pdf.

Stone Fruits:

- **Peach leaf curl** has begun showing up in full force on some farms. This fungal disease thrives in cool, wet springs following a mild winter. Sound familiar? Unfortunately, the fungicide timing window for peach leaf curl has passed. If you see curling leaves in your blocks, the best approach to mitigate the damage will be to:
    1. **Be sure not to over-crop** (or maybe don't crop at all if it is severe and you can afford to leaves those trees to recover)
    2. Focus on providing those trees with **proper irrigation and an extra shot of nitrogen fertilizer this spring.**
    3. If trees are able to re-foliate this summer, don't worry, because the leaf curl fungus does not have a secondary infection period (so the regrowth should not be infected).
    4. If trees are not able to re-foliate this summer, don't worry, because that just means the tree is saving its energy to come back strong next year.
    5. **Mark your calendars now to be sure to apply a fungicide on all curly leaf trees this fall after trees go dormant (usually ~November) and again in the spring before buds begin to swell (usually ~March).** Fixed copper fungicides have some efficacy, but your best defense will be chlorothalonil or ziram (as market allows).
    6. **To recap, tree health is your main concern now, and a well-timed fungicide will be critical in the fall and/or spring.**
- **Oriental fruit moths** are flying. We have an ~April 30h biofix date across most of the region (see graph above – orange line is a trap set in a peach block). For now, we are at ~120 degree days across the region (out of 350 to time larvicide application).
- **Plum curculio** is active when temperatures are above 60F. As stone fruits reach shuck fall AND once the bees have been removed from the orchard block (and nearby apple blocks as well), consider applying Assail or Avaunt (or see the Recommends for other options).

Berries:

- While we don't have a freeze on the horizon, now is a good time to confirm that your irrigation, floating row cover, or other frost protection method of choice is ready to go if the need arises.
- In blueberries, put out **cranberry fruitworm and/or cherry fruitworm** traps to monitor these migratory moths, whose larvae cause webby berries filled with crumbly frass. Hang traps for different fruitworms at least 50 feet apart, placing them in rows close to the hedgerow.

- Now is a good time to apply fertilizer to blueberry and bramble plantings.
- The frost on April 25-26 left early strawberries with a lot of black blossoms, affecting the earliest crop. A cover spray to control for botrytis gray mold will help protect remaining blossoms, as this fungus feeds off of killed blossom tissue and spreads to healthy open blossoms.

On the Horizon

- **Why is early thinning so critical to control or reduce 'seed load' in Honeycrisp?:**
  - This is due to the high number of seeds that are produced when flowers are fertilized. Pollination of Honeycrisp flowers that opened earlier this week were just fertilized yesterday.
  - Seeds produce an anti-flowering hormone named gibberellin (GA). GAs are produced in large quantities in the seeds, so an important goal in chemical thinning is to control 'seed load'.
  - Blossom thinning and petal fall thinning are critical to remove blossoms and fruitlets as early as possible to reduce the seed number per tree and therefore gibberellin concentration in the buds for next year.
  - By now growers should start getting ready for the NAA+carbaryl spray at petal fall when fruitlets are 5-6mm. If conditions are ideal this can accomplish the required thinning but in most years an additional spray is required when fruitlets are 11-12mm of NAA+carbaryl.

- **If using mating disruption for Dogwood borer or the Peach tree borers**, hang those disruptors soon (or now). Larvae are beginning to pupate, and you will want to hang disruptors before the beginning of the moth flight, or else disruption is a waste of your money.
- Have a plan in place for apple **petal fall insecticides.** These could go on as early as this weekend/next week depending on block. **If there are still bees in your blocks, DO NOT apply insecticides until hives have been removed and wild bees are not foraging on apple blossoms.**
  - **Plum Curculio** management begins as soon as petals are completely off all the trees in the block. Materials effective against PC include: Exirel, Imidan and Verdepryn (also control OFM), Actara (also controls Rosy apple aphid), Assail, and Avaunt.
  - **Wolly apple aphid** can be controlled by Movento, Senstar Sefina or Sivanto at this timing. If you had any WAA damage last year, you will want to get a petal fall spray on for WAA whether you see any signs of it yet this year or not. Considering the mild winter and the aerial colonies are already beginning to see, it is likely to be a very bad year for WAA.
  - Include Proclaim, Rimon, or Intrepid in the petal fall spray if you have a history of high **Oblique Banded Leafroller** damage. This may also help with OFM, depending on how timing works out.
  - **San Jose Scale** can be controlled by Movento (with a penetrating adjuvant), Sivanto, Esteem or Centaur, generally to be applied around the PF or 1st cover timing.
  - **Mites.** Consider scouting the underside of leaves for European red mite. If you find high populations, highly effective products include Agri-Mek, Apollo, Onager, Savey, Zeal, Kanemite, Nexter, Portal, Acramite, Envidor, Nealta, or Banter. If you already applied for ERM, be sure to rotate to a new IRAC code.

- **Tarnished plant bug** adults have been observed in **strawberries**. Sprays are recommended when nymphs are in the flowerbuds; scout anytime during bloom. The action threshold for a spray is when 4 out of 15 flower clusters are found to have at least one nymph. To check nymph number, slap a flower cluster against your open palm and they will fall out.

Good to Know

More Information on Berry Cold Hardiness and Further Reading

Open strawberry flowers are hardy to 30˚F.

Many blueberry plants are in bloom; the open blossoms are hardy to 27˚F.

Resources and further reading

Tarnished Plant Bug | Strawberry IPM | Sonia G. Schloemann, UMass Amherst https://ag.umass.edu/fruit/fact-sheets/strawberry-ipm-tarnished-plant-bug#:~:text=Identification%3A%20The%20tarnished%20plant%20bug,mouthparts%20(like%20a%20mosquito).

Frost Protection | Tips and Techniques | Kathy Demchak, Penn State University https://bpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/0/7265/files/2017/01/frost-protection-tips-techniques-1qelzi6.pdf

Monitoring for Blueberry Fruitworms | South Central New York Agriculture Team | Molly Shaw, Cornell Cooperative Extension https://bpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/0/7265/files/2017/01/bbfruitworm-1kqao28.pdf

The entire CCE LOF team would like to welcome Dr. Brian Lawrence, a young and bright scientist, who is currently working as a Postdoctoral Associate at Cornell AgriTech in Dr. Robinson's program this year and for the next two seasons.

Brian is currently conducting a large set of experiments and has already analyzed large and complex data sets/wrote several reports, and presented at several meetings this past winter. He has demonstrated a tremendous capacity for high-quality research work, and we are very excited to have him at Cornell. Brian attended the intensive precision orchard technologies workshop organized by IFTA this past February. Despite his very busy schedule in Geneva, he has been gracious enough and had already actively supported the CCE LOF extension and Cornell DATA programs (led by Cornell faculty Dr. Yu Jiang). He is currently helping us to conduct on-farm research at one of the Orleans sites (Orchard Dale Fruit Farm LLC.) to be used as an Agtech tour stop during the 2024 WNY summer tour planned for Tuesday August 13 (please mark your calendars!).

A short update of the digital technology work with the use of two drone technologies during bloom with Brian's support in the LOF region and at Cornell Agritech:

Last week and early this week we conducted blossom scans with the use of two drones: (1) the Aurea drone technology, and (2) the Outfield drone technology.

The Outfield and Aurea drone technology companies both use images captured by drones to help growers better manage their orchards. The process of getting started and receiving information from any of the drone companies is rather simple. Growers purchase a drone of their choice, capture images of the blocks they desire, upload the images to the respective drone company website, and quickly receive maps of blossom density, crop load, or yield estimation to guide management.

The Outfield drone which Cornell is currently using costs less than $4k and is programed to fly routes created by Outfield, which makes capturing images safe and easy. Although Outfield is based in the United Kingdom, their customer service has also been outstanding (Figure 1).

In the case of the Aurea drone technology, we collaborated closely with Ross Ganz (VP/Owner of Lagasse Machine and Fabrication Inc., in Lyons, NY) who arranged/paid the services of a drone pilot (CNY drone services) on Tuesday May 6 (for one flight in a Wayne block in the morning and for a second flight in an Orleans block in the afternoon). The CNY drone service company sent the file to the Aurea drone company in the Netherlands the same day after finished both drone scans.

Ross provided the blossom density map (Figure 2) produced by Aurea to the Cornell team yesterday. We were able to conduct a quick ground-truth evaluation of the blossom variability map produced by Aurea for the Orleans site yesterday (Table 1). Our preliminary results indicate that the blossom variability map was very accurate at the Orleans site. More details of this work will be provided later and will be included/discussed during the summer tour stop to be conducted at this site on August 13, 2024.

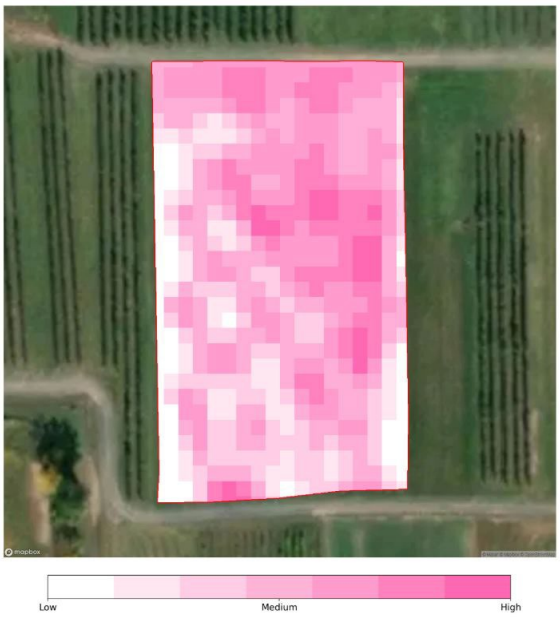


Figure 1. Although Outfield is based in the United Kingdom, their customer service and blossom variability map results of the drone scans conducted at Cornell AgriTech have been good and accurate so far. The accuracy of a drone flight conducted yesterday (May 9) at one on-farm site located in Orleans County will be assessed and reported later.

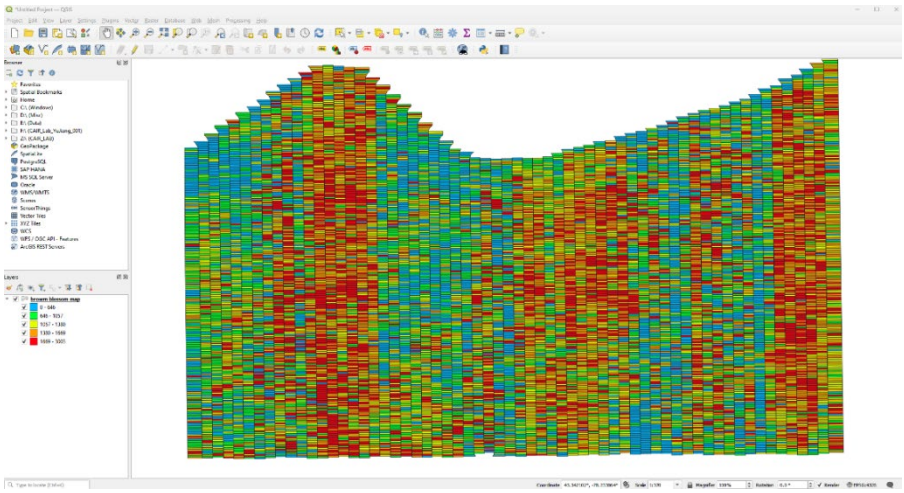


Figure 2. Blossom variability map (blossom density/cm^2 for blue color (less/low bloom) from 0 to 646, green color from 646 to 1057, yellow color from 1057 to 1380, orange color from 1380 to 1669, and red color (high/more bloom) from 1669 to 3003) produced by Aurea drone company for one large block in Orleans County (drone flight conducted on Tuesday May 6; variability map received on Thursday May 9; and Cornell ground-truth validation work conducted the same day on Thursday May 9).

Table 1. Results of a quick Cornell ground-truth validation work conducted at one block at Orchard Dale Fruit Farm LLC., Orleans County on Thursday May 9, 2024.

Blossom variability map (blossom density per cm^2, color coded by Aurea, see above map)	**Relative bloom density**	**Number of flower clusters/tree**		**Accuracy of the blossom map variability produced by a drone company**
		Tree 1	**Tree 2**	
Blue (0-646)	Low	17	39	Accurate
Green (646-1057)		39	124	Accurate
Yellow (1057-1380)	to	74	110	Accurate
Orange (1380-1669)		138	157	Accurate
Red (1669-3003)	High	137	155	Accurate